

VOLUME 3 NUMBER 8 AUGUST 1996

# OS/2<sup>®</sup>

A G A Z I N E

## Reviews

**DBExpert 2.0.1**

**Seagate Backup 2.0**

**Source Integrity 7.1c**

# Local Network, Global Network

**LAN Meets  
Internet**

**Page 20**

**Plus**

**SOM 3.0**

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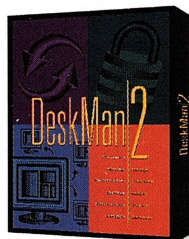
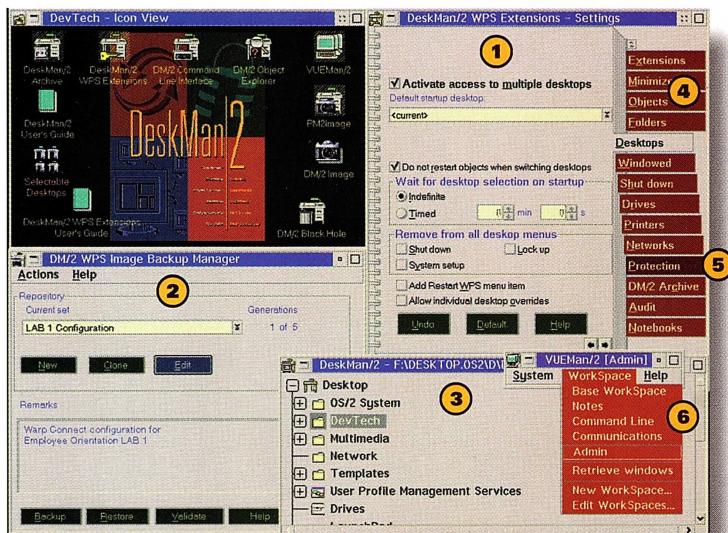
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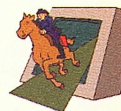
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# Table of Contents

Volume Three Number Eight August 1996



## Features

### 20 Network Meets Internet

Nearly everyone wants a direct LAN connection to the Internet. Fine—but be advised that hooking your network to the global network's not as easy as dialing your local service provider. Here's a look at some of the pluses and minuses of a direct connection, and hints for setting one up quickly and cost-effectively. *By Steven J. Vaughan-Nichols*

### 26 Exploring Internet Relay Chat

There's more to the Internet than e-mail, Web pages, newsgroups, and FTP. Join us in real time, thanks to IRC, or Internet Relay Chat—which offers chat rooms just like those you'd find on America Online or CompuServe. But for free, of course. *By Herb Tyson*

### 30 Connecting to OS/2 Sockets

Want to write Internet-enabled applications? It's not difficult to develop programs that work with TCP/IP. All you'll need is a C compiler, a good development system, a TCP/IP developer's kit, and some good advice. *By Steven J. Gutz*



### 38 Event Programming in REXX

Coding a functional and attractive GUI application is a lot more work than writing a simple text-based program. For one thing, you'll need to write event-driven code in order to control windows, sliders, and buttons—and that's a whole new mindset for the REXX programmer. *By Merrill Callaway*

### 47 The World of Objects

*Roger Sessions* examines the System Object Model 3.0 and how it's the industry's most complete CORBA implementation.

### 52 GUI Corner

*Mark Benge* and *Matt Smith* look at the CTLDATA parameter to OS/2 PM custom controls.

### 56 OS/2 Toolbox

*Guy Scharf* reviews Mortice Kern Systems' Source Integrity 7.1c, a source-code management utility.

## Reviews

### 60 Test Drives

*Brian Proffit* reviews Seagate Backup 2.0 (formerly Arcada Backup), and DBExpert 2.0.1.

### 68 Scanning in OS/2

*Esther Schindler* tests desktop scanners from Canon, Fujitsu, Hewlett-Packard, and Mustek.

## Columns

### 16 Tips & Tricks

*David Reich* discusses long file names, Aptivas, and more.

### 66 The REXX Column

*Dick Goran's* potpourri includes finding files, numeric and character strings, and disk volume labels.

### 72 End Notes

*Stan Kelly-Bootle* reads OS/2 Warp Presentation Manager Mentor and OS/2 Warp Presentation Manager for Power Programmers.

## Departments

### 7 Perspectives

### 9 Letters

### 10 Dateline: OS/2

### 14 Just Announced



## Editor-in-Chief

Alan Zeichick  
zeichick@acm.org

## Senior Managing Editor

Theresa Mori  
tmori@mfi.com

## Assistant Managing Editor

Tor Berg  
tberg@mfi.com

## Editorial Assistant

Amy Wu  
awu@mfi.com

## Editor-at-Large

Dick Conklin  
os2mag@vnet.ibm.com

## Art Director

David Bergeron  
dbergeron@mfi.com

## Senior Contributing Editors

Brian Proffit  
75300.1466@compuserve.com  
Esther Schindler  
esther@primenet.com

## Contributing Editors

Mark Benge  
banzai@raleigh.ibm.com  
Dick Goran  
dgoran@cfsrexx.com  
Stan Kelly-Bootle  
skb@crl.com  
David Moskowitz  
76701.100@compuserve.com  
David Reich  
speedracer@austin.ibm.com  
Guy Scharf  
guy@swarc.com  
Roger Sessions  
roger@fc.net  
Matt Smith  
msmith@prominare.com

## Publisher

Peter Westerman (415) 905-2392  
pwesterman@mfi.com

## National Sales Manager

Catherine McConville (415) 905-8115  
cmconville@mfi.com

## Assistant

Jana Outlaw (415) 356-3367  
joutlaw@mfi.com

## East/Midwest Sales Manager

Gary Ciocci (603) 924-9141  
gciocci@mfi.com

## Eastern Sales

Gordon Peery (603) 924-9141  
gpeery@mfi.com

## Advertising Production Coordinator

Nadia Khastagir

## Marketing Manager

Susan McDonald

## Marketing Graphic Designer

Azriel Hayes

## Group Circulation Director

John Rockwell

## Group Circulation Manager

Lucinda Formyduval

## Circulation Manager

Stephanie Blake

## Assistant Circulation Manager

Mark Johnson

## Newsstand Manager

Deborah Caris

## Reprints

Stella Valdez (916) 983-6971  
svaldez@mfi.com

# Miller Freeman

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## Editorial Offices

Our editorial offices are located at:

OS/2 Magazine

Editorial Department

600 Harrison St.

San Francisco, CA 94107

fax (415) 905-2499

os2mag@mfi.com

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|                   |            |
|-------------------|------------|
| Mark Benge        | 73532,2063 |
| Dick Conklin      | 76711,1005 |
| Dick Goran        | 71154,2002 |
| Stan Kelly-Bootle | 70323,1560 |
| David Moskowitz   | 76701,100  |
| Brian Proffit     | 75300,1466 |
| David Reich       | 76711,632  |
| Guy Scharf        | 76702,557  |
| Esther Schindler  | 72241,1417 |
| Matt Smith        | 70363,1175 |
| Alan Zeichick     | 76703,756  |

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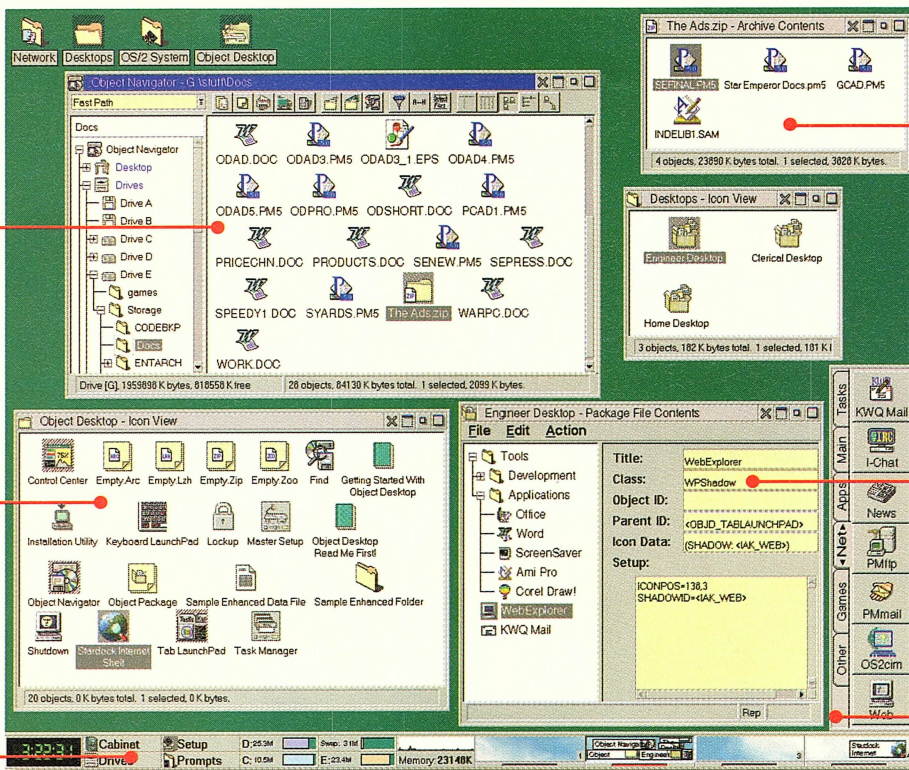


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**Object Archives** allows you to work with your ZIP files as if they were standard OS/2 folders. View data and even run programs right from within the archive.

**Object Package** enables users to distribute their objects or entire desktops. It's truly the next generation way to manage your desktop.

The **Tab LaunchPad** allows you to manage your programs. It even keeps track of running programs in the "Tasks" tab.

"Object Desktop brings the OS/2 desktop up to its potential and, in doing so, brings it up to date. And it does it so well, I predict it will be an instant hit and best-seller for OS/2 for a long time. No one who sees it will want to do without it."

-InfoWorld.

"Object Desktop makes OS/2 look and feel like a new version."

-PC Magazine

"With the fine reputation Stardock has developed for OS/2 applications, I don't hesitate to recommend Object Desktop fully."

-OS/2 Magazine

"Object Desktop complements OS/2 so well that your immediate response is bound to be, 'That's the way a computer is supposed to work.' If you use OS/2, get Object Desktop. It's simply splendid."

-Computer Shopper

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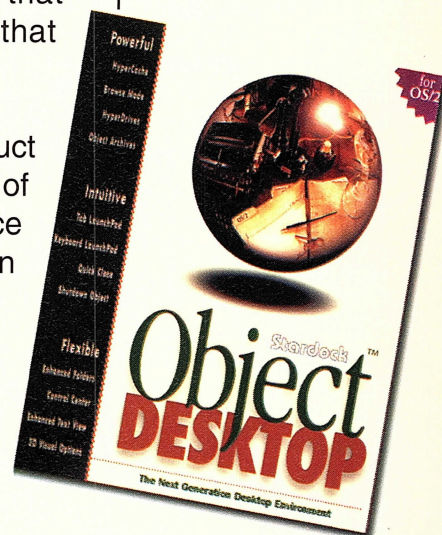
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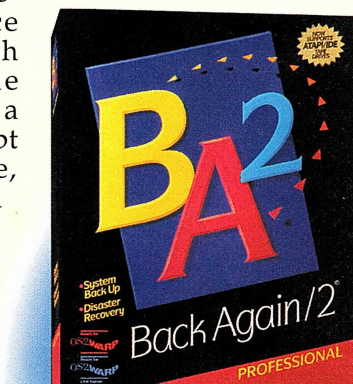
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# Perspectives

## Zippin' Along

**J**ust when I thought I'd finished spending money on computer peripherals, it had to happen. I'm smitten with the Zip Bug.

It all started last year, when I spotted the little purple drive in Peter Westerman's office. Peter, *OS/2 Magazine's* publisher, is the only business manager I know who writes PERL code as a hobby. He's often first on the block with a new toy, and his Zip drive was no exception. At first, I thought it was a tape-backup system. But no! It was a portable drive for 100MB removable disks, shaped slightly different than conventional 3.5-inch floppies. Pretty nifty, I thought, but I was leery: Back in the mid-80s, I supported about a dozen 20MB Iomega Bernoulli drives, and they were nothing but trouble. So I decided to wait.

Then I noticed that a lot of my friends and co-workers had Zip drives, and all seemed to be singing their praises—with nary a single problem to report. I paid a little more attention. Then in February, my home system's hard disk filled up. Again.

I started researching the Zip drive. The results were positive: The Zip drives support OS/2, and Iomega even offers OS/2 drivers for download from America Online (keyword IOMEGA), its FTP site (Iomega recommends the mirror at <http://www.inetgate.com/iomega>), or BBS (801-778-5888). If you'd like Iomega to mail you the drivers, you'll pay \$19.95 for the privilege—think of it as an "OS/2 Tax," because support for DOS, Macintosh, and Windows 3.x/95/NT is included right in the box.

A week later, I had a nice shiny new Zip drive, the external version that connects to a parallel port. (There are three models: external parallel and external SCSI, each for about \$200; and internal SCSI, for about \$220. The individual disks cost under \$15.) The OS/2 drivers installed flawlessly, making the Zip drive appear to be just another drive letter. Iomega's disk utilities to format, duplicate, and otherwise manipulate Zip disks are Windows-based, but run fine inside Win-OS/2.

So, I did some housecleaning, archiving old data files into large .zip files on Zip disks. Other directories, filled with rarely used programs, I either simply moved to the Zip drive, or deleted and reinstalled. I went through a half-dozen Zip disks, but no more disk-space problems! I've even dealt with my "15-minute CD-ROM" pet peeve by designating one Zip disk as my "CD-ROM Software" disk, installing CD-ROMs onto that one disk, rather than my hard drive.

My next step: The office. It only cost about

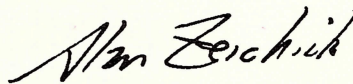
\$30 to buy a duplicate power supply and interface cable, so I could carry the Zip drive between home and work. That made it easy to keep my home and work systems in sync. However, I'm using the Zip at work so often I'll probably request a company-owned drive—probably the internal half-height variety to go right inside my desktop PC—when I next submit a departmental capital budget.

**T**he latest wrinkle in the story revolves around an old IBM ThinkPad 720 I recently purchased. It has one 160MB removable hard drive—and upgrades for this Micro-Channel-based laptop cost a fortune! The best price I've found is \$898 for a 520MB drive from Fair Oaks, California-based Corporate Upgrades (916-536-3710, fax 916-536-3719), and that's simply more than I'm willing to spend on an old machine.

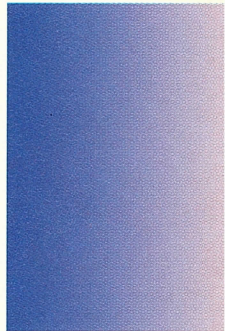
Not only is my Zip drive pressed into duty as a backup device for the ThinkPad, but I'm also using it as a removable external "hard drive." I'm even using it to install CD-ROM-based software: In many cases, the amount of software on a distribution CD-ROM is less than 100MB. So, using my desktop system, I copy from the CD-ROM to a clean Zip disk and then install from the Zip disk to the ThinkPad. The drive (18 ounces with disk inserted) will be even more valuable as a laptop accessory when Iomega finally ships its 8-ounce external battery pack, which it announced last January but still hasn't delivered as of press-time.

Recent moves by other computer companies have increased my comfort with Zip as an emerging standard. Iomega is aggressively licensing the technology, so you can currently buy Zip disks made by Fuji and external Zip drives manufactured by Epson. (Epson's drive is less expensive; I've seen it discounted to \$150.) Hewlett-Packard is even planning to sell some of its Pavilion-series PCs with an internal Zip drive. So volume should be high, and second-sources plentiful.

That's it! Once I buy the external battery pack, I'm finished spending money on computer peripherals. Well, for now, anyway. I wonder how long it'll be until someone offers a \$500 CD-Recordable drive....



Alan Zeichick  
Editor-in-Chief







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# Letters

## "I think that Wayne Rash's review of OS/2 Warp Server was pretty unfair."

### A better value

Dear Editor:

I was interested to read the article on ISDN by Wayne Rash in the May 1996 issue. It was a good introduction but had some errors and omitted some useful information.

The article did not mention that some RBOC phone companies can provide a single ISDN voice channel. At 56K, it is a little slower than a single 64K B channel, but is normally fast enough for Internet access or home-office-to-company LAN connections. NYNEX costs just \$8 more per month than a normal phone line. Because you pay so-called voice rates, its running costs are usually significantly lower than data rates. Call costs are no more than analog calls, so you can use unlimited calling plans for your Internet service!

In the list of hardware, Wayne did not even mention the Motorola Bit-surfr ISDN adapter, a terrific device that comes with software that makes configuration very easy. You can buy internal and external models, though alas not a PCMCIA version. I have successfully used my Bitsurfrs with OS/2 Warp, Windows 3.11, Windows NT, and Windows 95. Bitsurfr comes with at least one RJ-11 phone socket to connect your analog modem; the

Bitsurfr Pro comes with two. The Bitsurfr is great value at \$275-\$300.

The IBM Waverunner is indeed a great idea. An analog modem and an ISDN adapter, combined in a single card, seems like an ideal combination for someone who has access to an ISDN connection at one location and yet travels with a portable PC.

Or so I thought. The Waverunner I bought never worked with anything but Windows 3.1. It certainly didn't work with OS/2, Windows NT, or Windows 95. IBM confirmed that Waverunner was not tested with—and wasn't expected to work with—my IBM ThinkPad 755. Maybe I was optimistic to expect otherwise.

For the price of one Waverunner, I can buy two Bitsurfrs. True, they are not as portable, but they work!

Thanks for a great magazine.

Lee Hammond

### Smoothly and easily

Dear Editor:

I wanted to tell you that I think that Wayne Rash's review of OS/2 Warp Server (June 1996) was pretty unfair.

I installed it smoothly and easily. I put in the first two boot disks, filled in the TCP info, and went to lunch. When I came back, everything was up and running. And this has been the same since the early betas of the product. Maybe he had a bad experience, but I think that the product is excellent and again, doesn't deserve the image of sure-problem—I quote, "with OS/2 Warp Server, bugs come in bunches"—just because he had some problems.

By the way, these are *my* opinions. And I'd also like to know if he has ever administered a network before.

Ramiro Diaz Trepas  
IBM Argentina  
NCC Solutions Group

*I'm pleased that one of IBM's employees had good results installing OS/2*

*Warp Server. Unfortunately, one user's good or bad results doesn't guarantee that other users will experience the same. The fact is that OS/2 Warp Server, as we reviewed it, is buggy. Despite the concerted efforts of IBM's engineering staff (who were onsite during the review), we almost didn't get it to run at all. I'm glad Mr. Trepas did not encounter any problems, although I wonder if, as an employee of IBM, he is an objective source.*

*In any case, the mail I've been receiving from readers indicates that there are indeed bugs.*

-Wayne Rash

### Complicating matters

Dear Editor:

I read Wayne Rash's article on OS/2 Warp Server in the June 1996 issue. I've obtained a copy of the software and am trying to load it. At one point, he talks about "Further complicating matters..." I am having this problem. Rash did not give directions on how to change the maximum number of connections to get around the hang up. Can you help me?

Mike McArdle

*If you can get OS/2 Warp Server to run at all, re-run the tuning utility. Otherwise, manually change the max-connections parameter to a much lower number (for us, the parameter was set at about 900; we changed it to something like 50).*

-Wayne Rash

### APL is right

Dear Editor:

I'm delighted that you included an article on APL2 in the June 1996 issue (pp. 42-45). Gregg Taylor did a great job of getting a lot of information about the history and uses of APL with examples of the language itself into four pages. I'm especially pleased that OS/2 Magazine got the character set right.

Curtis A. Jones

## Errata

We incorrectly reported SofTouch System's upgrade policy for Filestar/2 2.0 in the June "Just Announced" (pp. 16-18). The free upgrade offer is actually for customers who purchased version 1.0 after March 1, 1996.

In our 1996 Buyers Guide, we inadvertantly overlooked two OS/2 resellers in "Where to Buy OS/2 Software" (p. 9). Contact Office Solutions at (800) 897-2777, (310) 439-5567, (310) 438-7888. And contact OS/2 Express at (800) 672-5945 or (919) 873-9472. Our apologies for the omissions.



# Doing Business

BY ALAN ZEICHICK

## Good news for OS/2 Warp Server

It's selling! In early May, IBM announced that OS/2 Warp Server 4.0 had sold 50,000 licenses through the end of April—about two months after the software became generally available.

This is great news for the OS/2 camp in its battle against Microsoft's Windows NT. IBM is especially proud of survey results released by *Information Week*. The newspaper found that 30% of respondents will purchase OS/2 Warp Server in 1996, compared to 24% for Windows NT Server, and 16% for Novell's NetWare 4.x.

Caution is still indicated, however. Considering that the OS/2 Warp Server had a 40,000-unit beta program, it's far too soon to tell how well the new server will fare with new customers. IS departments take a long time to evaluate major new network technologies, and OS/2 Warp Server undoubtedly is being studied by many, many potential customers. So is Windows NT, which is still receiving the lion's share of mainstream press coverage despite—or perhaps because of—the fact that it's not shipping yet.

The next revision of OS/2 Warp Server, designed for symmetric multiprocessing systems (SMP), went into beta in early June. It's scheduled to be generally available in the third quarter of this year.

## Merlin update

Not much is new on the Merlin front since last month. IBM still says that Merlin (the next version of OS/2 Warp Connect) will ship sometime in the second half of 1996; pricing and nam-

ing have not been determined; and we don't have any new screen shots.

The only IBM update we have is that Merlin will be the first Intel-based operating system to integrate Java support right into the operating system. Java is Sun Microsystem's language for developing applications that run over the Internet; currently, you can only run Java applications by using a Java-enabled Web browser, like Netscape's Navigator 2.0 or later. (IBM's WebExplorer 1.03, the current shipping version for OS/2, does not support Java.)

According to IBM, each Merlin client will include an integrated Java run-time engine, as well as a developer's kit that will allow OS/2 users to write their own Java applications (presumably, if they already have a C++ compiler). Because run-time support is built into the operating system, rather than being part of a Web browser, you should be able to run a Java application just by double-clicking its icon. As long as you're connected to the Internet, you're in business.

We've also heard from Fredrick, Maryland-based Cirrus Technology, which has announced that Merlin will include a demo version of its Unite CD Maker software. The crippled version, which will only allow 100MB or 11 minutes of music to be recorded on a CD-Recordable (CD-R) disc, is designed to give all OS/2 users—whether they own a CD-R drive or not—the experience of mastering a compact disc. That's the first official word about non-IBM software bundled with Merlin; the remaining contents of the BonusPak are still up in the air.

## OS/2 Warp for PowerPC, RIP

I had to hear about it from Mark Smith, editorial director of *Windows NT Magazine*: IBM finally pulled the plug on OS/2 Warp Connect (PowerPC edition). It was available via special request for price quotation (in IBM-speak, "RPQ #19H1100") until March, when it silently faded off the product sheet. According to IBM's media relations team, the operating system was discontinued when IBM retired an entire generation of PowerPC-based PCs, since it wouldn't be compatible with IBM's later PowerPC offerings.

Not with a bang, not even with a whimper...a sad ending for a much-anticipated product whose time just never came.

## Sundial's on a roll

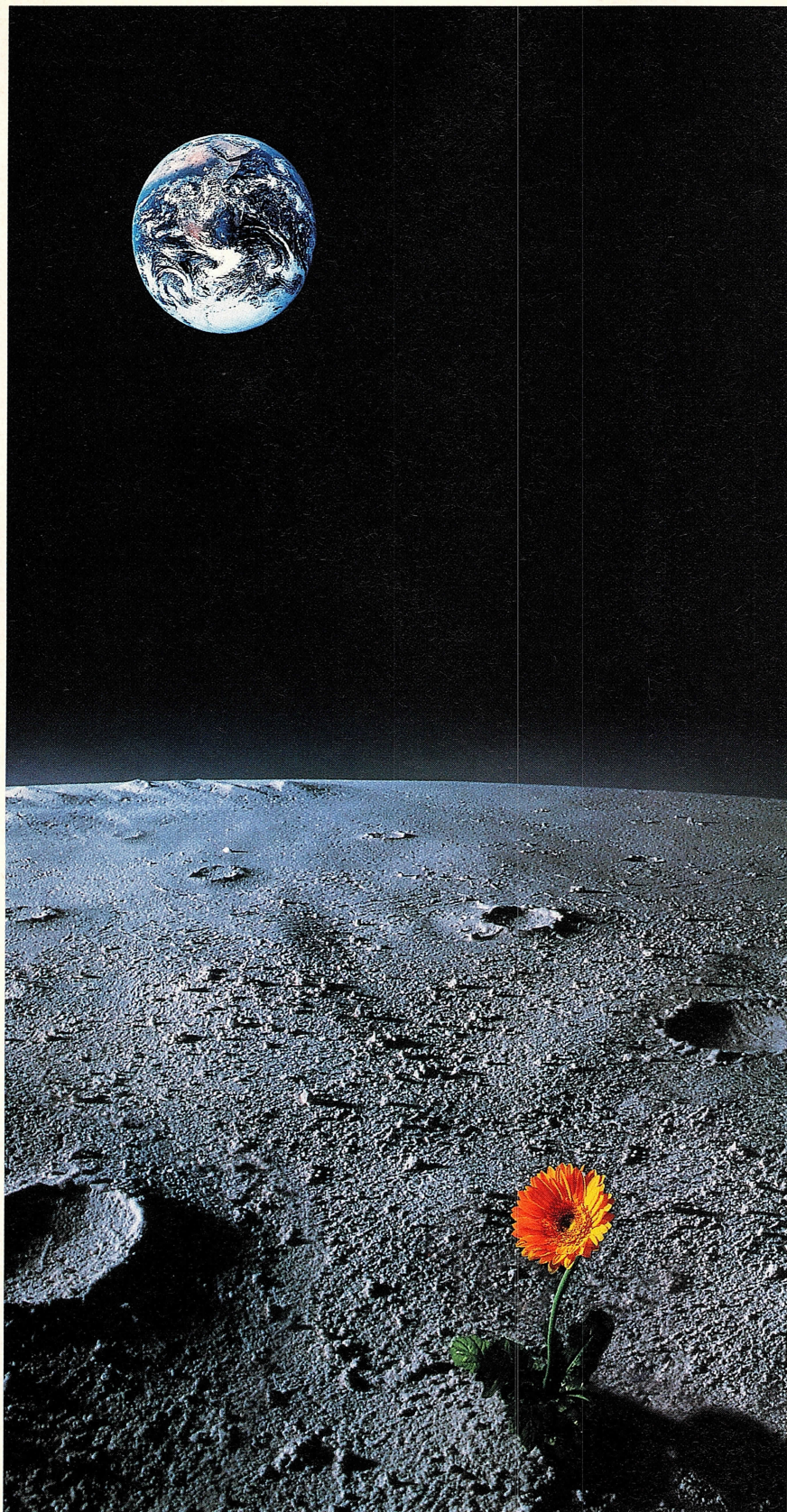
Is Sundial a home for unwanted OS/2 applications—or are they hatching plans to take over the world?

The Seal Beach, California-based Sundial Systems Corp. has acquired the rights and source code to Mesa 2, the spreadsheet developed by Athena Design Inc. of Boston, Massachusetts. This development follows close on the heels of Sundial's April acquisition of the Clearlook word processor from Clearlook Corp. of Burke, Virginia.

Athena Design Inc. continues to exist as a separate company, and still owns the Mesa code developed for the NeXT and OpenStep platforms.

The latest version of the spreadsheet generally available is Mesa 2.04; version 2.11 has been in beta test for several months. According to Randall Flint, president of Sundial, its priority is to get the update out the door in





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late June or early July. The update will probably be numbered Mesa 2.12, to distinguish it from the widely distributed beta version. Mr. Flint promises that Mesa 2.12 will offer significant performance improvements over Mesa 2.04, plus a smaller memory footprint.

What's ahead? Once Mesa 2.12 ships, Sundial will resume work on Mesa 2.2x, which will offer improvements to the user interface and increased OpenDoc integration.

The big picture, says Mr. Flint, will be moving the products to a component strategy. There's been significant SOMobjects and OpenDoc development on all three of Sundial's main products: Clearlook, Mesa, and the Relish time-management software.

## What does "Aquantia" mean?

As we reported last month ("The Preload Situation," July 1996, p. 22), the number of hardware manufacturers or resellers offering OS/2 preloaded is improving.

Here's the latest: Unisys. IBM's full

line of OS/2 software, from OS/2 Warp Connect to OS/2 Warp Server to the "Project Eagle" Software Servers, will be available as preload options on Unisys's Aquanta desktop and laptop PCs. For more information, check out <http://www.pc.unisys.com/Aquanta/aquanta.html>.

That's good news, because the IBM PC Co. is no longer preloading OS/2 on its newest ThinkPad laptops. For example, according to an IBM press release from May 17, the new Pentium-powered ThinkPad 560 notebooks "are preloaded with an exceptional selection of software including Netscape Navigator and Windows 95." Of course, the IBM PC Co. states that these models will support OS/2 Warp and WebExplorer, but the days of Select-a-System, when IBM's customers had a choice right out of the box, appear to be over.

## DeScribe this

The soap opera from Naples, Florida-based DeScribe Inc. continues.

Back in late March, DeScribe an-

nounced that it would be suspending development of its flagship product, the DeScribe word processor, which was offered in two forms, including the innovative DeScribe Voyager CD-ROM. According to DeScribe, the company was searching for a buyer for its technology. DeScribe President James Lennane said the problem was due to an unhealthy OS/2 software market.

The next step was reorganization. In early May, the controversial Mr. Lennane, who infuriated many DeScribe customers by instituting oppressive anti-piracy measures (later rescinded) back in 1994, stepped down as president although he remains a major shareholder.

Later in May, DeScribe's new management team announced that software development was resuming, with an update—DeScribe 5.0.5—due to be released sometime after July 1, 1996. The new executables can be downloaded and used for free by all Voyager CD owners; they'll be posted at <http://www.describe.com>. **OS/2**

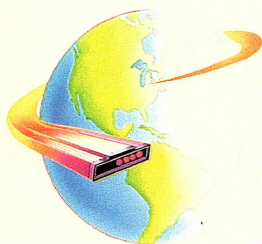
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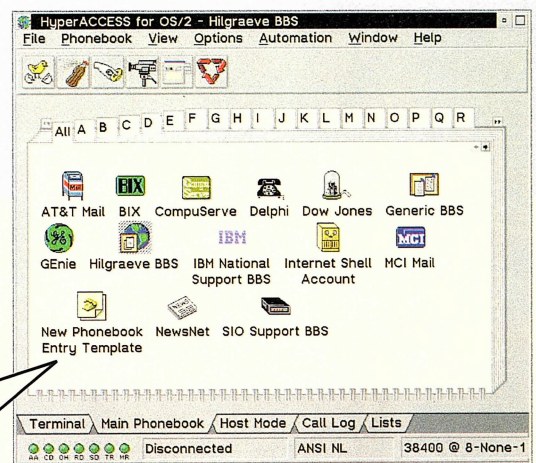
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Cirrus Technology is constantly updating its vendor list. Please contact us for a current list of other supported CD-recordable vendors.

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# Just Announced

## Gibbon FTP

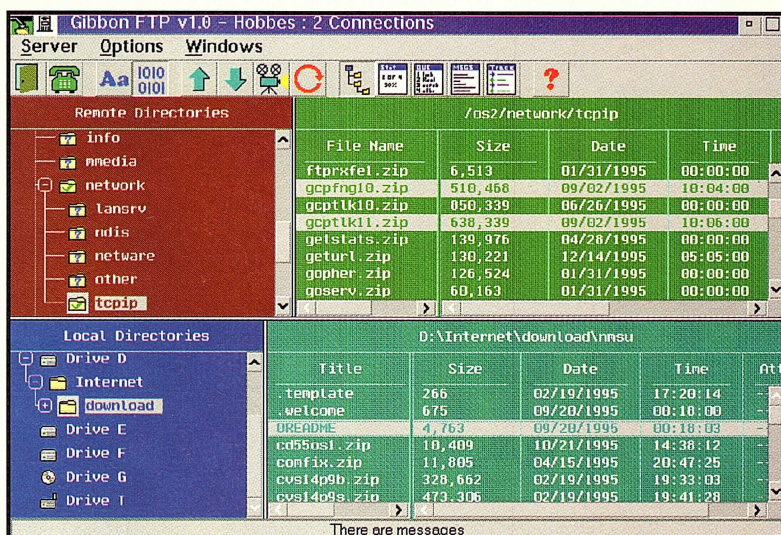
### Shareware file transfer

**G**ibbon Computer Products Inc. (GCP) announces the availability of Gibbon FTP, a graphical FTP client for OS/2 2.x and OS/2 Warp.

Gibbon FTP has drag-and-drop file-transfer support, directory caching, firewall support, and a highly configurable user interface. Instead of a "quick pick" list, Gibbon FTP puts servers in group folders. This FTP client can make two connections to an FTP site, so file transfers can take place using the second connection. File types can be defined so that Gibbon FTP automatically selects the correct transfer mode, either ASCII or binary. The file types list is also used to define viewers. An internal viewer is available for text files, and external viewer programs can be used for text and other files, such as .gif, Postscript, and .wav files.

Gibbon FTP is shareware with a 30-day trial period. Registration is \$20.00 U.S. It is available now for download from GCP's FTP and Web sites. The URLs are: <ftp://ftp.gibbon.com/pub/gcp/gcpftp10.zip> and <http://www.gibbon.com/catalog/catalog.html>. Free registration is available for qualified reviewers.

Gibbon Computer Products Inc., (612) 754-6557, e-mail [support@gibbon.com](mailto:support@gibbon.com), or see its Web page at <http://www.gibbon.com>.



READER SERVICE NO. 106

## FontFolder 2.1

### OS/2 ATM font manager

**F**ontFolder is a native OS/2 shareware font manager that allows you to use large collections of Type 1 fonts in OS/2 without slowing the system or generating long font selection lists in applications.

New features in this version include the Move Font Files utility; a Register All Fonts feature that will search a directory or subdirectory and register all fonts that it finds; a "tear-off" window that shows up to 10 font samples for comparison with other fonts as you browse; and multikey-stroke navigation through long lists of font names.

FontFolder offers point-and-click font installation. Users can create FontPacks, collections of fonts that can be installed and removed as a single unit. The Font Browser feature per-

mits rapid browsing of fonts regardless of whether or not they are installed. Furthermore, users can print a variety of font-related sample sheets: specimen sheets show various text samples of a single font; character sets show all characters for the current code page for a single font; the Font Catalog gives one-line samples of a collection of fonts; and the Font List shows file names and locations for collections of fonts.

FontFolder 2.1 can be downloaded from the following sources: <ftp.cdrom.com/pub/os2/wpsutil/fntf21.zip>; <ftp.leo.org/pub/comp/os.os2/pmttools/fntf21.zip>; BMT Micro at <ftp.wilmington.net/bmt-micro/fntf21.zip>; or CompuServe, [fntf21.zip](ftp://ftp.compuServe.com/pub/comp/os/os2/pmttools/fntf21.zip) in library 1 in the OS2BVEN forum. Registration is \$30 with printing and \$20 without printing. An upgrade from 1.x or FF Lite is \$10.

Cliff Cullum, (914) 528-9144, or e-mail [ccullum@ibm.net](mailto:ccullum@ibm.net).

READER SERVICE NO. 107

## Desktop Commander

### REXXless desktop control

**P**innacle Technology introduces Desktop Commander, a tool specifically designed for OS/2 that gives desktop control without the need for REXX. Desktop Commander allows a network administrator to "snap" a picture of an ideal workstation for a group of workers. Restrictions for this group can then be applied to options such as Move, Rename, Copy, and Delete. The completed desktop profile is centrally stored to a small configuration file or "profile," which the administrator can associate with specific LAN user identifications. With the Machine Independent Desktop function, users can make changes to their personal desktops that follow them around as they go to different machines.

Desktop Commander is fully compatible with many popular LANs,



including Novell NetWare, Banyan Vines, LAN Server, and TCP/IP.

Suggested retail price for Desktop Commander is \$59; site licenses and upgrades are also available. A 30-day money-back guarantee is included.

Pinnacle Technology, (800) 525-1650, (317) 279-5157, or e-mail [info@pinnacletech.com](mailto:info@pinnacletech.com).

READER SERVICE NO.108

## TE/2 Pro! Test Drive

### Try before you buy

**O**beron Software has made a Test Drive version of its TE/2 Pro! telecommunications program available to the public. The Test Drive is a full-featured copy of TE/2 Pro! 2.0 that will execute 50 times, giving users an opportunity to evaluate the program. Once a registration code is supplied, the 50 execution limit is lifted.

An object-oriented, Workplace-Shell-aware telecommunications program for OS/2 Warp, TE/2 Pro! features robust telecommunications support, seven terminal-emulation modes, fast file-transfer protocols, extensive REXX scripting, an object-oriented user interface, support for multiple simultaneous sessions, built-in asynch, TCP/IP and named pipe support, and multiwindow chat and scroll back.

The Test Drive version is available as [te2pro20.zip](#) from: Oberon's BBS at (507) 388-1154 or the company's Web page at <http://prairie.lakes.com/~oberon>; the OS/2 Shareware BBS at (703) 385-4325, <telnet://bbs.os2bbs.com>, or <http://www.os2.com>; from Hobbes at <ftp://hobbes.nmsu.edu/os2/comm>; and from the GENie OS/2 RoundTable library on Page 1400;3.

Suggested retail price for TE/2 Pro! is \$99.95. For a limited time, Oberon is offering the program for \$79.

Oberon Software Inc., (507) 388-7001, fax (507) 388-7568, or e-mail [oberon@prairie.lakes.com](mailto:oberon@prairie.lakes.com).

READER SERVICE NO. 109



## Just Announced OS/2 Internet Sites

### Below Zero

<http://www.pacificablue.com/belowzero>

A new OS/2 store on the Web! Be sure to check out its specials.

### OS/2 Job Openings

<http://www.electriciti.com/bttech/os2jobs.html>

Looking for an OS/2 programming job? A LAN or Systems Engineer job? A new service by BT&T Consumer Technology lets you find them all at this one convenient location.

### OS/2 Word Processing Mail List

<http://www.best.com/~mperry/os2word.html>

Michael Perry's OS/2 word processing mail list. Includes information on graphics import, spreadsheets, and so on. Check out this page for subscription information.

### Tim Sipple's Warped World

<http://www.secant.com/sipples/>

Keep up to date with OS/2 Warp, most especially OS/2 events in the midwestern United States.

(Information courtesy of Vicki Conway, [vicci@ibm.net](mailto:vicci@ibm.net).)

## OS/2 APPLICATIONS TOP 15 LIST—MAY 1996

| This Month's Rank | Last Month's Rank | Product                         | Company           |
|-------------------|-------------------|---------------------------------|-------------------|
| 1                 | 3                 | Object Desktop                  | Stardock Systems  |
| 2                 | 8                 | Hobbes CDROM Archive            | Walnut Creek      |
| 3                 | 1                 | Partition Magic v2 Personal Ed. | PowerQuest        |
| 4                 | 5                 | BackMaster v2.0                 | MSR Development   |
| 5                 | 6                 | System Commander v2.2           | V Communications  |
| 6                 | 4                 | DeScribe Voyager CD             | DeScribe          |
| 7                 | 2                 | IBM AntiVirus v2.4              | IBM               |
| 8                 | 7                 | UniMaint                        | SoftTouch         |
| 9 (tie)           | 11                | Galactic Civilizations          | Stardock Systems  |
| 9 (tie)           | -                 | Neon Graft 3D Light CD          | Compo Software    |
| 10                | 10                | GammaTech Utilities             | SoftTouch Systems |
| 11                | -                 | SimCity 2000 for OS/2           | Maxis             |
| 12                | -                 | Performance Plus v3             | Clear & Simple    |
| 13                | 14                | Back Again/2 Professional Ed.   | Computer Data St  |
| 14                | -                 | Sytos Premium v2.1              | Arcada            |
| 15                | -                 | KopyKat v1.2                    | Hilgraeve         |

Since OS/2 Warp and OS/2 Warp Connect are consistently ranked as top-selling products, and sales of additional licenses can sometimes skew results, this list has been modified to highlight only the top-selling OS/2 applications. (Best-seller information courtesy of Indelible Blue.)





# Updates and New Stuff

BY DAVID REICH

TIP 245

## APTIVA RECOVERY

**Q:** I own an Aptiva that had Windows 3.1 and OS/2 installed in a dual-boot configuration. That was fine at first, but now I want to have multiple operating systems and be able to access them using boot manager.

Using a combination of Partition Magic and FDISK, I've set up a boot manager at the beginning of drive C: and created a 250MB logical drive on which I want to put OS/2.

I'm having a problem installing OS/2 Warp on this drive, because the Aptiva ships with a recovery CD-ROM that is unlike the CD-ROM I would get if I bought OS/2 Warp off-the-shelf.

I haven't been able to install OS/2 Warp on this drive using the recovery CD-ROM. When I called IBM, the representative told me that the Aptiva was never meant to be set up with an advance install using HPFS.

I want to have both Windows 95 and OS/2 on my system so that I may compare the two and use each for what it does best.

**A:** I consulted the OS/2 Aptiva install wizard Jeff Grantz, and he explained the theory behind the Aptiva preload issues to me.

Essentially, Aptiva hardware has advanced features that, in some cases, aren't found on your everyday "other" computers. Additionally, some of the configuration options chosen for Aptivas are unique to certain hardware configurations.

One other factor is that the CD that ships with preloaded Aptiva systems is a recovery CD and not a regular install CD. You can think of it as an XCOPY (it is really a group of .zip files) of everything on the C: drive on a CD; it allows a user to recover the state in which the machine came from the store. All the applications are installed, device drivers are correct, and the desktop is already set up.

Recovery is not intended to provide the flexibility of an install, but to be a simple way to get back to where you started. The .zip files correspond to the separate root directories, so if you inadvertently (or on purpose) wipe out an application, you can get the application back without resetting the entire system to square one.

It appears that you are looking for a way to copy a C: OS/2 boot drive to a D: drive and make it work (including the application's own pointers). It can be done, but not by the faint of heart.

An easier path is to create two primary partitions and use the recover CD to recover into one and put the other operating system into the other. You can then use BootManager to flip between them. This method does not allow a lot of data sharing (because only one boot partition is visible at any given time), but you get both systems easily. You could also put data files and other applications into an extended logical partition to share programs and data there.

Going out to buy a new shrink-wrapped OS/2 package will not solve the problems. None of the OS/2 packages currently on store shelves have the required device drivers or

specific features for the Aptiva. To circumvent this problem, you would have to find the drivers elsewhere, and then install each along with the specific applications.

TIP 246

## SERVICE ON APTIVA

**Q:** I would like to install FixPak 17 on my Aptiva M70, but the instructions indicate that this cannot be done. Is there a workaround for this, and do I need to obtain a shrink-wrapped version of voice dictation to make it work?

**A:** There is special code on the M70 that will be disabled if FixPak 17 is installed on it. This isn't a bug in the FixPak, but a configuration issue with the FixPaks, the code on them, and the special configuration of some Aptiva models. IBM is aware of this situation and is working on a solution. Keep an eye open on the BBSes and Internet areas where OS/2 service is discussed to see when an announcement is made.

TIP 247

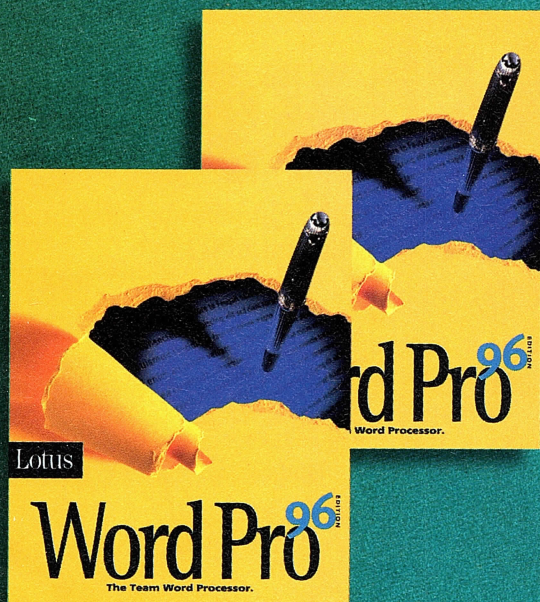
## LONGNAMES ON FAT

**Q:** You have previously written that programmers should stick with the APIs and not try to create their own .longname attribute. How would a third-party program create a file with a long name on a FAT drive? Or



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Lotus Word Pro 96 offers a whole new way of looking at word processing. And now we're combining the Team Word Processor with the power of the OS/2 Warp operating system, for an unbeatable combination. Lotus Word Pro for OS/2 Warp is now available in stores near you. Call 1-800-TRADE-UP, ext. C150

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\*Lotus Word Pro 96 for OS/2 Warp requires OS/2 Warp as a minimum operating system requirement. ©1996 Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus and Working Together are registered trademarks and Word Pro is a trademark of Lotus Development Corp. All other products are registered under their respective companies.

Reader Service No. 10



## plogo100 Movement

In regard to Tip 232 ("Boot Logo," May 1996, p. 21), several people have informed me that the program to create OS/2 boot logo screens (*plogo100.zip*) was not on the Hobbes FTP site where I said it would be. In the electronic universe, servers are reorganized on a regular basis. Instead of looking in *os2/warp/sysutils* for *plogo100.zip*, you can find the program at */os2/graphics/plogo100.zip* (unless, of course, it gets moved again before this column is printed).

should only the Workplace Shell (WPS) be allowed to do that?

If I'm writing with an editor that needs to keep one or more backups of the current file and, for safety, renames the old file to the backup name and then writes out the new file, how can it preserve the long name without writing a *.longname* attribute?

Wouldn't it be better if, instead, programmers were informed of the rules for exactly how the WPS relates *.longnames* to 8.3 names?

**A:** In general, my suggestion to allow the APIs to handle long file names is

still valid. However, as with most things, these "rules" are rules of thumb, and as such, there certainly are valid reasons for not adhering to them. This is one of them.

IBM made a conscious decision to not support the creation or preservation of the *.longname* Extended Attribute (EA) when moving or copying long-named files via the command line from HPFS to FAT drives. Part of the problem for programmers is that no published standard exists. However, because the WPS creates and supports the *.longname* EA for this operation, you may just want to incorporate that into your programs.

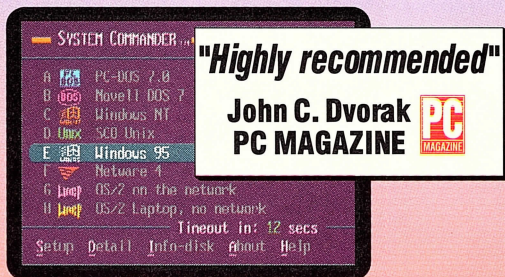
One argument against incorporating this function is that the function can change in the future; still you may want to help users and build this interoperability with the shell into your programs.

You could write your programs so that when they read from FAT drives, they look for a *.longname* EA, and if the user requests to save a file to a FAT drive with a long file name, you could create or update a *.longname* EA. Of course, no established standards for this procedure exist, but given how the shell operates, it seems like a reasonable thing to code into your applications if you want to support this function. **OS/2**

*David Reich, a contributing editor, has written numerous articles on OS/2 and is the author of Designing High-Performance OS/2 Warp Applications, published by John Wiley & Sons. Questions can be addressed to David via CompuServe at 76711,632 and via the Internet at speedracer@austin.ibm.com.*

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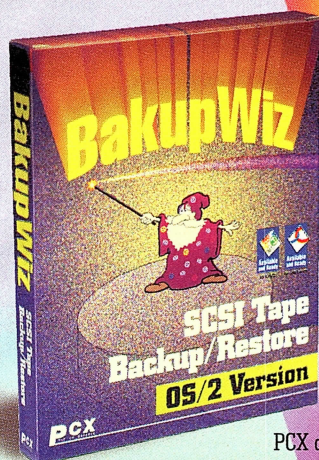


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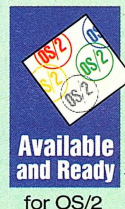
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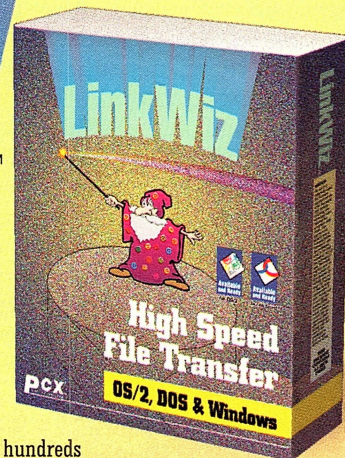


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# Network Meets

**S**o, you want to hook your network up to the Internet? Well, get ready for a lot of hard work. Connecting a LAN to the Internet is an order of magnitude harder than linking up an individual connection to the Internet. Still, the business benefits can outweigh the disadvantages.

Before going to the trouble—and it will be trouble—of connecting your network to the Internet, make sure you know why you're doing it. First, will it be cost-effective? If all you need are employee e-mail accounts for a few people, you're probably better off getting everyone individual accounts with your friendly neighborhood Internet Service Provider (ISP). On the other hand, if your employees are using those accounts to spend hours every day writing to their friends, then putting e-mail under company control is a must.

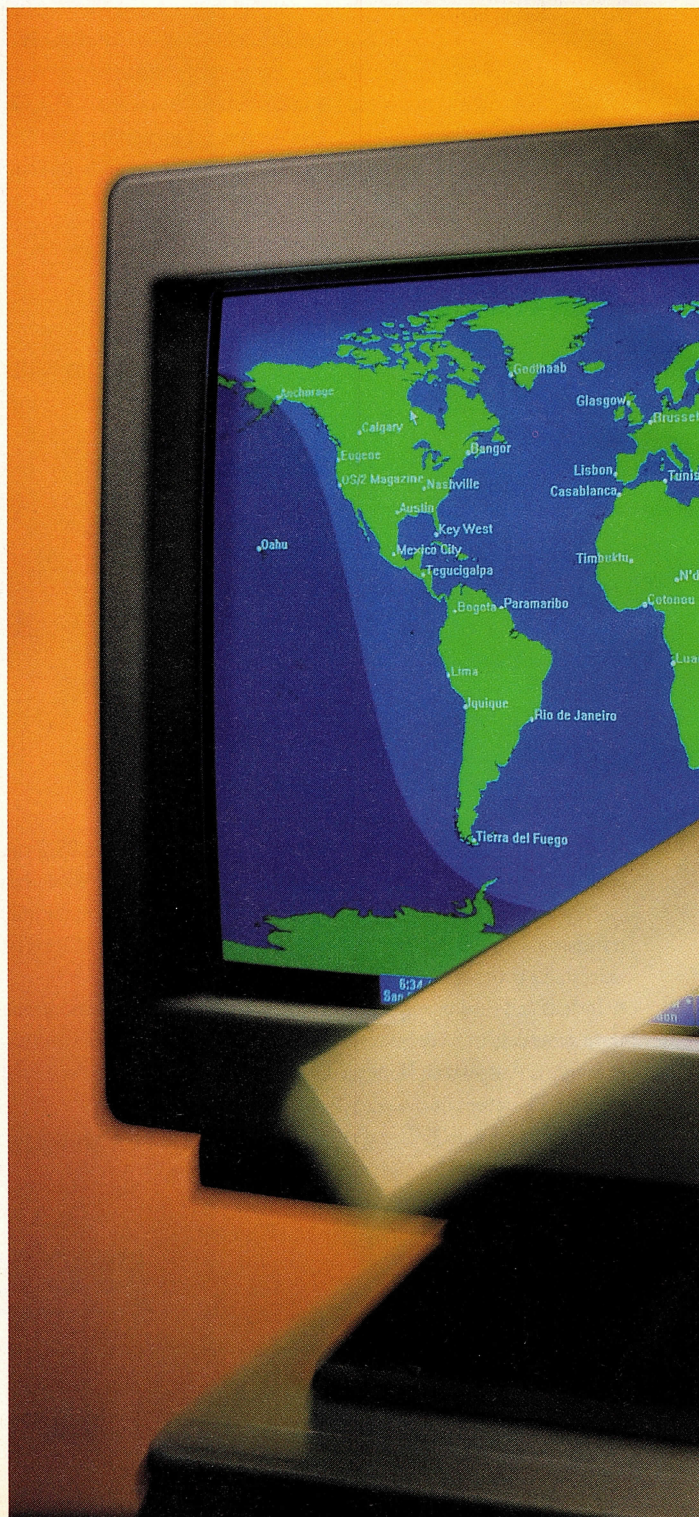
The same holds true with using the Internet for searching. If only a few people need to do serious Net data hunting, then not everyone on the LAN needs to have access to the Net.

Even if you're going to put up a few Web pages for your business, you may not need your own connection to the Internet. Hundreds of ISPs are available that will be more than happy to give you space on their Web servers, editing and design help with your HTML pages, and maintain the whole kit and caboodle every day, all day, for cheaper than you could probably do it at home.

With all that, why would you want a LAN connection? The number one reason is security. If you let employees have Internet access, you're also letting their machines—and from there, the entire network—become open to viruses, worms, and other nasty things that make your server go bump in the night. More dangerous, however, is the possibility that any Serial Line Internet Protocol (SLIP) or Point to Point Protocol (PPP) connection—the most common individual connection types—can be used not only by your employees to get onto the Internet, but also by outsiders to come into your system. Both these dangers are, despite all the hype, very rare. Your data is in far more peril from a disgruntled employee than from any virus or cracker. Still, it only takes one such emergency to ruin months of work.

Another reason you might want a LAN connection is control. Human nature being what it is, you'll find that everyone uses the Internet for play from time to time. That's okay, so long as it doesn't go too far. One effective way of limiting Net surfing, short of annoying the heck out of everyone by peeking over their shoulders, is to control Internet access through a gateway system.

The last reason to get a LAN connection, but hardly the least, is money. While for small-time Internet users, it's not cost-effective to have a LAN connection, it's an entirely different story if you have multiple users frequently using the Internet or a complex Web site that





# Connecting your LAN to the ultimate WAN

By Steven J. Vaughan-Nichols

# Internet



you hope will draw a lot of business. In these cases, it's often penny-wise and pound-foolish to go with many individual accounts or put all your Web service into the hands of an outside vendor.

## Finding the right fit

If you've read this far, then you've probably decided to go for an Internet connection. Your first decision, and in many ways your most important one, is what type and how fast of connection to get. The answer depends on your needs. In Table 1, you'll find information to help you decide what's right for you.

You'll notice in Table 1 that I don't even bother with 14.4- or 28.8Kbps modem connections. While such connections are fine for individuals, these connections are speed traps for network computing. Remember that the true connect speed of a LAN user will be the speed of the link divided by the number of all the users trying to use that link at a given moment. Confusing? Let's take a concrete example: A 28.8Kbps hookup with four users at once would give each user only 7.2Kbps worth of bandwidth. (It gets even worse if you have a Web page or someone telecommuting in, because then people outside of the LAN will be sharing that same bandwidth.) In short, if you have only a few users, you're much better off with giving qualified users their own modem.

## Finding a business ISP

After choosing the type and speed of the connection, you'll need to get a reliable Internet provider. How can you tell which ones are reliable? It's not easy, but here are some of the things to look for. First, the ISP must have a 24-hour, seven-days-a-week network operations center. Even if your business isn't open 24 hours a day, you want your ISP to have some kind of engineering support on hand so that problems are handled immediately, rather than showing up in the morning only to find your Net connection down.

Good technical support is also a must but can be difficult to find, because as soon as anyone gets decent at Internet technical support, they can find themselves a better job. All you can look for is a place that has as close to 24-hour, seven-day support as you can find. Also, ask how many help-desk people and customers the company has, so you can determine which ISP has the highest ratio of customer support staff to customers. Of course, the higher, the better.



## Where the Servers Are

**F**or the most up-to-date news on what's what in Web servers, the place to be is Meyer's HTTP Server Systems available for OS/2 (<http://w3.aces.uiuc.edu/DLM/HTTPDforOS2.html>). If you want immediate gratification for your server hunger, here are the URLs for the most important OS/2 Web servers:

Apache 1.0.3b, <http://www.slink.com/ApacheOS2>

Bearsoft HTTPd OS/2 1.06, <http://www.bearsoft.com/abs/httpd.html>

GoServe 2.47, <http://www2.hursley.ibm.com/goserve>

IBM Internet Connection Server 1.0, <http://www.ics.raleigh.ibm.com/icsbeta/OS240g.htm>

IBM Internet Connection Secure Server 1.1, <http://www.raleigh.ibm.com/iss/issover.html>

OS2HTTPD (Frankie Fan's port of NCSA HTTPD v1.3) 1.04, <ftp://ftp.netcom.com/pub/kf/kfan/overview.html>

OS2WWW Power Web Server++ 2.06, <http://www.compuser.com.co.za:80/powerweb>

Thomas Seeling's TSwwww server Alpha 2, [http://www.uni-giessen.de/~g087/cern\\_os2.zip](http://www.uni-giessen.de/~g087/cern_os2.zip)

Note: This is a download site only — no informational site exists for this program.

Your ISP also needs to have its own high-speed connection to the Internet. If the ISP's connection is just a T1, then you get to share that company's 1.54Mbps bandwidth with all the ISP's other users. That's a no-win situation. Look for at least multiple T1s, or a T3 if possible.

### Connection

Once you've determined how and who, the next step is what. Each connection will require a different hook-up device. Unless you know exactly what you're doing, let your ISP be your guide on these matters.

In any case, you're going to need a router. A router can be either a program on a server or a separate hardware device. Its job is the same, regardless. It directs packets of data between your network and the Internet. A router makes certain that your users can reach the Internet and, to a limited extent, that someone on the Internet can't reach into your network.

Getting a full-time connection up is not a trivial task. Expect to wait at least a month from the time you place the order to when your LAN and the Internet are actually on talking terms.

Pricing will vary enormously, depending largely on the level of service from your ISP and your connection speed. A bare-bones installation for a small company will run you about \$1,500 to start, with a monthly operating cost of at least \$500 a month. Larger operations will cost more, but unless you move into the

higher-speed SMDS and T3 speed classes, the cost jumps are not very big. At the top levels, almost all transactions must be uniquely crafted for your company. You may also find that you'll need to work not only with your ISP, but with a value-added reseller (VAR) to get just the right mix of hardware and software for your enterprise.

### Security

If you haven't done so already, sometime during the setup process you're going to need to establish security for your LAN.

OS/2 Warp Server enables you to set up password protection for users, files, directories, and devices. That's a good start, but it's not enough. People can be lazy about protecting their passwords, and it's usually very simple to get someone's password.

A router is more than just the connection between your LAN and the Internet. It's also your first wall of defense against intruders. Almost every modern router will let you filter packets so that some packet types, like ftp, telnet, or HTTP, can be blocked from going in or out. You can use filtering so that any packets from an unauthorized network address site are automatically blocked. Filtering, however, is not a miracle cure for security woes. Someone who gets access to an authorized network address can still waltz into your LAN because they will appear to be an authorized user. This particular method of computer breaking and entering is called spoofing.

Using route and packet filtering requires expert network administration. If you don't already have a TCP/IP expert, you're going to need to get one to successfully use these security measures.

Today's most popular means of blocking out online trespassers is by using firewalls. A firewall is simply a pair of routers with a system between them that separates your network from the Internet. One router connects to the Internet, while the other hooks into your LAN. The system in the middle acts as a traffic cop. It lets authorized users out, using either simple or complex route- or packet-type filtering, and it prevents users from the outside from entering any further into the LAN. Experts can still spoof their way past the firewall, but it's far more difficult than breaking through a router's filtering routines.

### OS/2 Warp meets Internet

While you can use OS/2 Warp 3.0 with the most recent version of TCP/IP to connect to the Internet, you're really better off using OS/2 Warp Server. It's the throughput and file read/write demands of users that make this a job for a networking operating system designed with those two goals in mind. A small business could get away with using OS/2 Warp Connect for an Internet gateway; but if you have more than 10 people on your LAN, you'd be better off with the server version.

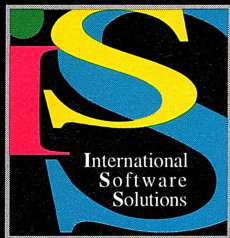
With OS/2 Warp Server you also get Enhanced TCP/IP, a.k.a. TCP/IP for OS/2 Warp Server, which gives you a selection of TCP/IP tools that make operating your Internet connection easier. These tools include portmap, a SendMail server, and Dynamic IP.

No matter which OS/2 version you use, the one that the operating system runs on should have one thing in abundance: RAM. Forget about trying with 16MB. You really need 32MB—and OS/2 Warp Server comes darn close to demanding it—and 64MB would be far, far better. The general rule is, if you have to choose between a faster processor or more RAM, take the RAM every time.

The system should also have a fast bus, and its network interface card

**Network Meets Internet, cont'd on p. 24**





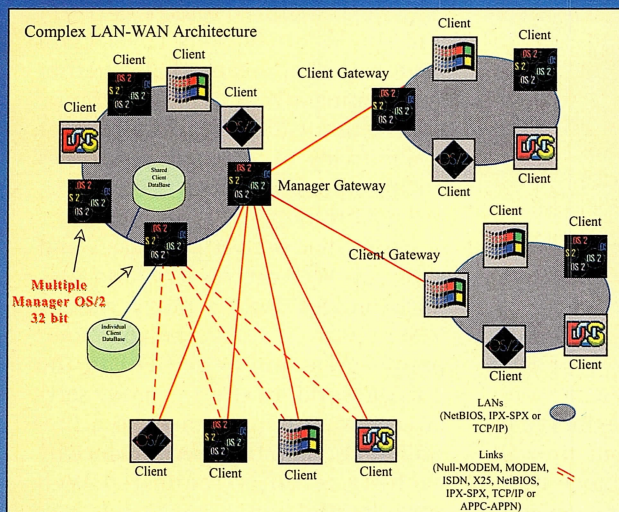
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- ♦ **Audit Trails** - audit trail connections (who, when) and files transferred
- ♦ **Programming Script Language** - create sophisticated applications for EDS (Electronic Distribution Systems) or ADC (Automated Data Collection)



Table 1: Uses, speeds, technologies.

| User Numbers | Speed            | Technology                       |
|--------------|------------------|----------------------------------|
| 1-5          | 56-64Kbps        | Switched/56 & ISDN               |
| 6-10         | 64-128Kbps       | Low-end Frame Relay & Bonded ISD |
| 10-50        | 128Kbps-1.54Mbps | Frame Relay & Fractional T1      |
| 50-100       | 1.54Mbps-34Mbps  | SMDS, T1, multiple T1s, T3       |

Switched/56 is a hybrid analog-digital technology that's nearing the end of its useful life. It delivers 56Kbps throughput.

ISDN stands for Integrated Services Digital Network and is the up-and-coming low-end business data connection of choice. It speeds along at 56- to 64Kbps.

Frame Relay is a technology in which you share a digital network with other users. Its speed depends upon the underlying network but typically varies from a sustained rate of 56Kbps to 1.54Mbps with burst rates up to 50% higher than the sustained rate.

Bonded ISDN (BISDN) uses both data channels on basic rate ISDN to achieve 128Kbps speeds.

Fractional T1s use a variety of techniques—often frame relay—to give you part of a full T1 connection's 1.54Mbps speed.

Switched Multimegabit Data Service (SMDS) uses dedicated digital connections to achieve speeds from 4- to 34Mbps.

T3s are the Rolls Royces of business Internet connectivity. A T3 connection starts at 45Mbps and moves up from there.

While there are faster technologies, these are usually difficult to obtain. Two other technologies are used that deliver business LAN viable speeds, but both are still rarer than hen's teeth. The first type, based around cable modems, operates at up to 10Mbps. The other technology, Asymmetric Digital Subscriber Line (ADSL), enables 8Mbps digital data communications over ordinary phone lines...in theory. In practice, ADSL is still wet behind the ears and barely out of the laboratory's door.

#### Network Meets Internet, cont'd from p. 22

(NIC) connection to the router and the network should be as fast as possible. Ideally, in today's market, you'd want something like the IBM 100/10 PCI Ethernet Adapter. Such cards work with both the 100Base-T Fast Ethernet standard and with PCI adapter slots for the fastest possible throughput for network Internet users.

#### Matter of protocol

The next question is whether to switch your entire LAN to TCP/IP or whether you can work with both TCP/IP and Server's native NetBEUI. Both ways have advantages and disadvantages.

If you switch your LAN entirely to TCP/IP, you get several big wins. First, you'll only be working with one networking protocol, which will make management much easier. Another plus is that you can use TCP/IP as an across-the-board stan-

dard, from your mainframes to your Macintosh systems to your DOS PCs. The problem with using only TCP/IP is that if someone does manage to break through your firewall, that person will have a much easier time accessing everything on your site.

As you might expect, the biggest advantage to using both TCP/IP and NetBEUI is that by making critical resources NetBEUI-only accessible, you've automatically improved your site's security. The bad news is that getting two network protocols to co-exist on a single NIC stack isn't easy. Fortunately, OS/2 makes this easier to do than other operating systems.

There are other problems with running two network protocols, and they can be summed up as: Using two protocols squares the number of network administration problems. So, if you feel safe with your network security, go with an all-TCP/IP solution.

#### Moving on the Net

For your users, the Internet and Usenet programs supplied in the IBM Internet Connection (ICC) should be sufficient. If they want more, an abundance of Internet and Usenet programs is available at all the usual sites, such as Hobbes (<ftp://hobbes.nmsu.edu/os2>) and Walnut Creek (<ftp://ftp.cdrom.com/pub/os2>). Before letting your users try these, you'll want to give each program a thorough going-over for any support or security problems.

Administrators have a far tougher time finding decent server software. IBM has just made contributing to the Net easier with Internet Connection Secure Server (ICSS) for OS/2 Warp. ICSS is a full-featured Internet services server. Besides HyperText Transfer Protocol (HTTP), ICSS also supports file transfer protocol (ftp) and gopher, not to mention Secure Hypertext Transfer Protocol (S-HTTP) and the Secure Sockets Layer (SSL) protocol. This means that whether you're using a Web page to distribute information within your company or you're trying to sell goods or services on the Internet, your data has maximum protection.

To further protect your users and speed up Web access, ICSS also supports proxies. With a proxy system, ICSS appears as a server to your company's users and as a client to the outside world. In effect, a proxy server acts as an improvement to a firewall. It also improves performance by caching recently requested Web pages locally.

To make ICSS more useful to your LAN, ICSS provides Application Programming Interface (API) hooks for the extremely popular Common Gate Interface (CGI). In the near future, you can also expect Java and Structured Query Language (SQL) support for DB2 to be enabled.

If you're not ready for a full-scale ICSS installation, you can give the nonsecure version of ICSS a free test drive. You can find its Uniform Resource Locator (URL) address, as well as that for ICSS, in "Where the Servers Are."

#### Something to site about

Of course, if you're going to have a Web site, you need to have docu-



ments on it. IBM supplies several interesting options for putting materials up on the Web.

The least attractive of them, to my way of thinking, is IBM's Electronic Publishing Edition for OS/2 (<http://booksrv2.raleigh.ibm.com>). This program enables you to create Book-Manager documents. That's fine and dandy—so long as you're sure that your readers can comprehend Book-Manager. However, if you're going to open your pages to the world, you'll find that your documents in this relatively obscure and proprietary format, for all its advantages, will go unread.

Instead, I suggest using Lotus's new Word Pro for simple HTML document production. If you want to deal with complex documents, consider Lotus Notes. And, for when you want to get really fancy, consider IBM's VisualAge for Smalltalk (<http://www.software.ibm.com/software/ad/vastub.html>).

There are other non-IBM solutions, too. Because this is such a fast-moving world, you might want to

contact other OS/2 systems administrators to find out what solutions work for them.

## Usenet dreaming

Once on the Internet, you can provide your users with Usenet e-mail and newsgroups. The first of these is a must. And although your users may clamor for the latter, you'll want to give newsgroups long thought. A newsfeed eats up a good deal of bandwidth and an incredible amount of disk space. Unless you have gigabytes of disk space to spare, you're better off just including a handful of Usenet newsgroups on your server.

You'll also have to deal with managing a newsfeed with what tools you can build yourself from REXX and Enhanced TCP/IP. No commercially shipping or even shareware Network News Transfer Protocol (NNTP) servers are currently available for OS/2. It can only be a matter of time, however, before someone creates one, since the NNTP programming is straightforward.

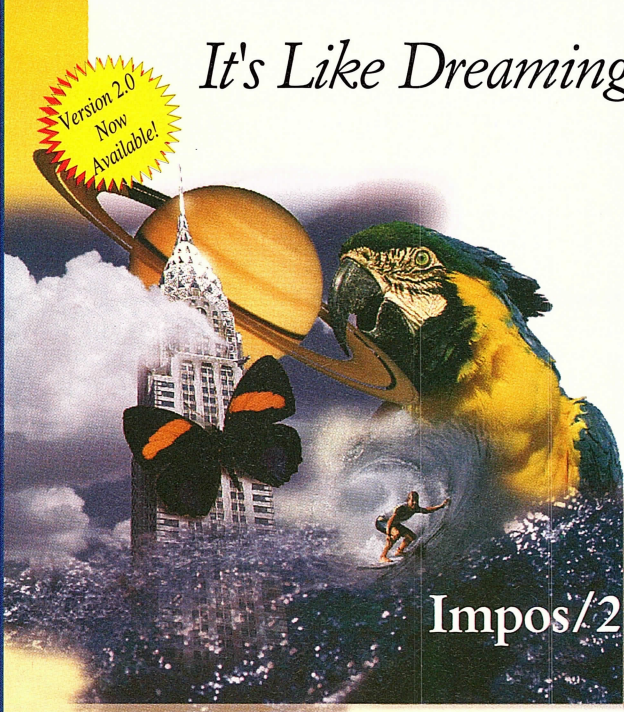
For mail, no Post Office Protocol (POP) servers currently exist. Send-Mail, which supports the Simple Mail Transfer Protocol (SMTP), comes with Enhanced TCP/IP and can be configured in a server mode.

## Business value

So, is it worth it? For most businesses, the answer is yes. However, while the benefits to a direct Internet connection are many, there are numerous hurdles along the way that must be safely navigated before you can win the gold of Internet connectivity. **OS/2**

Steven J. Vaughan-Nichols is chairman of the Internet Press Guild and a freelance writer based in Lanham, Maryland. See what he's currently up to on the WWW at <http://access.digex.net/~sjvn/vna.html>.

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# Exploring Internet Relay Chat

**Real-time conversations with a native OS/2 client. By Herb Tyson**

**A**sk about the benefits of the Internet, and you'll hear a speech about the wonders of the World Wide Web. Indeed, to many, the Web is the Internet. To tens of thousands of Internet inhabitants, however, the most exciting phenomenon is IRC, or Internet Relay Chat. Similar to CompuServe's CB groups and America OnLine's Chat Rooms, IRC is like a massive multichannel party line for Internet users. Armed with one of the many IRC client applications, you can use your keyboard and monitor to engage in real-time chats with other IRC users anywhere in the world. Daily, nightly, weekly, IRC users pore over their keyboards for technical support, casual chats, romance, pornography, philosophy, politics, poetry, software piracy, and more.

At present, two principal IRC networks are available. The larger and older network is known as the EFnet (Electronic Frontier), and the other is called the Undernet. The Undernet was created largely due to overcrowding on EFnet. With recent growth in the Internet and IRC popularity, on most evenings you'll have difficulty connecting to either network. You'll have more success before 7 P.M. on the East Coast of the US, and after 8 P.M. on the West Coast. On any given evening, you'll find active OS/2 discussions going on in both networks, with crowds ranging from 10 to 20 on the Undernet all the way up to 40 or more IRC users on the EFnet's OS/2 channel.

While the recreational uses for IRC are obvious, IRC can also be a serious business tool. By opening private channels or direct client-to-client (DCC) chats, you can conduct direct, real-time business conferences in which files and information can be exchanged readily. While OS/2 already has a tool that can handle direct conversations, Person to Person/2, IRC is easier to set up and use and has the advantage of being available for every platform that surfs the Internet.

## Chatting away

How do you get started? If you connect to the Internet using a shell account, chances are that you can use an IRC command to start a text-based UNIX IRC program. You'd probably type "IRC" at the UNIX command line. If you connect to the Internet using a SLIP or PPP account (which you're doing if you're able to use a Web browser), then you'll need to obtain an IRC client program.

The most popular IRC clients for OS/2 are GammaTech IRC from SoftTouch Systems, IRC/2 from Innovative Logic

Corp., and IRCII/OS2 from Max Mikhanosha. Other offerings include the still-in-beta NetComber suite (from IBM), PMIRC (by Roger Bess), and the Internet Adventurer (an Internet suite from Kim Rasmussen that includes an IRC client). Some users also prefer mIRC, for Windows, which runs well under OS/2.

IRC client software is simple to use. You start your IRC program, specify an IRC server to connect to, and then join or start an IRC channel. (Think of an IRC channel as similar to a citizens' band radio channel, identified by a word or phrase indicative of the topic.) At any given moment, the two major IRC networks will have anywhere from several hundred to thousands of open channels. If you don't see what you like, you can instruct the IRC program to produce a list, or launch your own channel and invite others to join. Many IRC users schedule regular, online meetings with friends, family, and business associates.

In addition to the #os/2 chat channels on both EFnet and the Undernet, you might sometimes find impromptu groups named OS/2Warp, Warp, or Merlin. You'll also find channels for various other operating systems, as well as channels where users exchange everything from .wav files to photographs to illegal copies of software (the latter usually on channels named warez).

## GammaTech Internet Relay Chat 2.00

GammaTech Internet Relay Chat (GTIRC) is the most popular IRC client for users who prefer a graphical Presentation Manager application. As this article is being written, GTIRC is one of only two PM IRC clients available as shipping (nonbeta) products. GTIRC is a solid performer, packed with convenient features that rival and often exceed those of the very popular mIRC for Windows. GTIRC benefits from the constant attention of Benny Ormson, the program's creator, who is an avid IRC operator and is always on the lookout for ways to make the client better.

**Installation and configuration.** GTIRC is available as a commercial product that includes a floppy disk and 151-page manual. GTIRC is also available over the Internet as demoware, letting you chat for 30 minutes at a time before you need to close and restart. While you probably won't need the manual during installation, you'll appreciate it later on for its list of IRC servers, its IRC primer, an IRC command reference, a glossary of IRC terms and abbreviations, and sample REXX scripts. Scripts



are lists of commands that can be used to automate certain IRC activities, such as channel control, automatically attempting to find a free IRC server, automatically responding to keywords, and the like.

On my 33MHz 486-based system, installation of the dozen files (which grows to 13 after the first time you run GTIRC) took less than a minute. Once installed, you're prompted to enter your user name (usually your mail ID), your real name (if you so choose), and your nickname, which is the name by which you'll be known while chatting on IRC. Clicking the Help button in this or any other dialog box in GTIRC summons an explanation of what's being sought.

Next, choose an IRC server and you're connected (unless the server is full). Finally, type `/join #os/2`, and you're suddenly in the company of some of the world's most illustrious (or notorious, take your pick!) OS/2 users. If you're new to IRC, you'll do well to stick with GTIRC's defaults for a little while. Once you've become accustomed to how IRC works, you'll undoubtedly want to explore the options menu. From here, you can control GTIRC's fonts, colors, startup options (to execute, for example, IRC commands, a script, or a REXX program at startup), toolbar, sound, and a host of other options and preferences. As you develop familiarity with the tools and jargon of IRC, the purpose of each of the options and why you might choose this or that setting will become apparent.

**Feature-packed.** Anyone who's used the other OS/2 IRC clients quickly comes to appreciate the elegance of GTIRC. Each time you join a new IRC channel, GTIRC creates a new window, letting you see multiple channels at the same time (Figure 1). GTIRC also helps prevent what sometimes happens with non-PM IRC clients, as multichannel users sometimes type a comment intended for one channel into the wrong channel. This *faux pas* might be especially embarrassing if you're chatting on `#religion` and `#hotsex` at the same time!

If someone sends you a private message, a separate window for the private chat opens up (optionally, of course), allowing you to maintain the private chat without having to type a `/msg` command before each comment. In a busy channel this feature can be a real boon because it prevents you from accidentally typing private comments into public IRC sessions.

Another handy feature is an optional nick (nickname) list that's displayed in the chat window. If you have enabled join and leave messages (messages that show who comes in and who leaves) and have a good memory, you might not need the nick list. On the other hand, if the channel is very busy, you might not want the extra clutter of the join and leave messages.

The nick list shows who's on the channel. In addition, when you right-click on a name in the list, you get a pop-up menu of applicable options (Figure 2). If you're a channel operator and need to kick someone off or ban them from the channel, you won't need to wrestle with IRC command syntax. The right mouse button activates other pop-up menus in different contexts as well.

GTIRC also has a toolbar with nine built-in tools and an additional four that you can configure to your liking. In fact, GTIRC has three different toolbars, each with four user-configurable tools. The three bars are for use in the main Control window, Channel windows, and Query windows (private chat windows).

One of the neatest things about IRC is direct client-to-client, which is built into most IRC clients. Like IRC, DCC is a protocol. Unlike IRC, DCC is more secure and isn't subject to the inconsistency and overload of the various IRC networks. DCC is used for conducting private chats, as well as for exchanging files. Suppose, for example, you have a treatise on software piracy you want to send to someone. You just type `/dcc send`, and GTIRC pops up a window for you to navigate to and select a file (you can also type the file name directly if you know it).

Another useful aspect of GTIRC is that it keeps a scrollable copy of the channel's activities during an IRC session, which lets you easily scroll back to copy a URL that flashed by, or to reread a comment that zoomed by too quickly. You can also save the session to a log file, which is handy for creating a transcript to share with others who might have missed the session. On some occasions, for example, you'll find active conferences that might include the likes of David Barnes and other OS/2 luminaries. With GTIRC, a transcript of the entire session is available immediately.

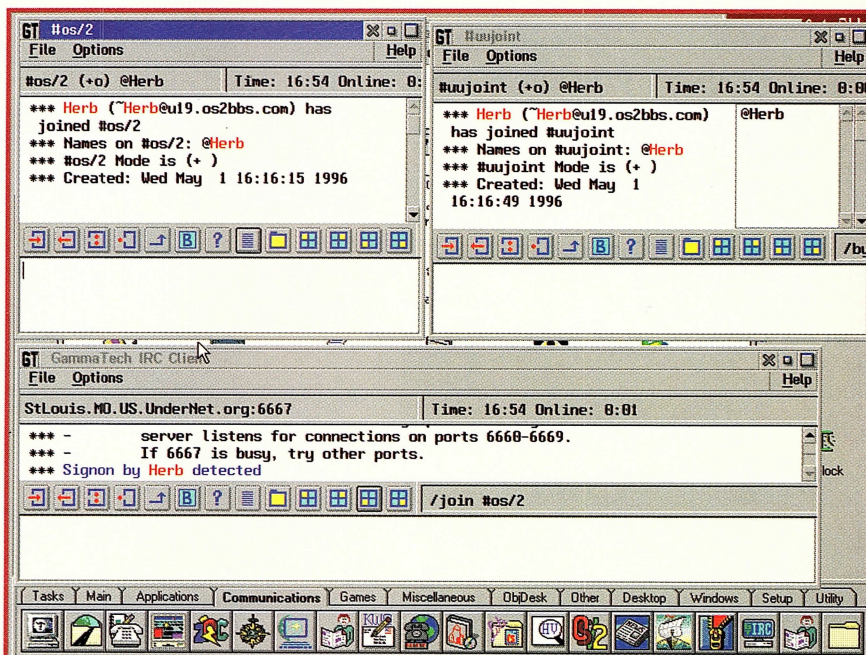


Figure 1: GammaTech IRC opens a new window for each IRC channel, letting you see multiple windows at the same time.



## Other shipping clients

A survey of the IRC alternatives to GTIRC for OS/2 users shows two nonbeta candidates and three that are in beta. There might be others by the time you read this article. Of course, history shows that not every beta gets to market.

One of the most popular IRC choices for OS/2 users is IRCII. IRCII's primary claim to fame is that it's free. Also on the plus side, IRCII claims to be the only OS/2 IRC client that's 100% compatible with UNIX IRC scripts. On the down side, IRCII can be daunting. The structure is command line only, requiring that you become proficient in IRC command syntax. IRCII has a built-in help system. However, the help system uses the same IRC window as the IRC channel you're using. In fact, everything must be done in a single window, unless you start multiple instances of IRCII, an option that some OS/2 users do exercise. All in all, however, this method adds to the complexity of using IRCII, making it a poor choice for users who prefer the intuitive simplicity of PM applications.

The other shipping client is IRC/2. Like IRCII, IRC/2 is a text client. This client's strengths include a startup script that attacks a list of servers to get you connected. In these times of

increasing IRC activity, finding a free server is a real challenge. IRC/2's script cycles through a list of servers, trying each one three times until you are connected. Neither IRC/2 nor IRCII has any built-in limitations to persuade users to register.

IRC/2 is a shareware product. Once the 30-day evaluation period elapses, the startup text will remind you that your trial period is over. Also like IRCII, IRC/2 is command line only, with no built-in scrolling of text. Thus, IRC/2 users may have difficulties keeping up in busy IRC channels.

## Beta clients

A rising star on the IRC horizon comes from Denmark in the form of the Internet Adventurer (IA). IA is a minisuite of Internet clients, all rolled into one package. The package includes IRC, a Web browser, and a file transfer protocol (FTP) tool. Though IA is still in very early beta, the documentation hints at future mail and newsgroup capabilities. IA is a very colorful PM client with a Flintstones toolbar motif at present. Like GTIRC, it supports multiple windows for different IRC channels and supports DCC connections. The beta is free, and Internet Adventurer probably will be a shareware offering when it's finished.

A while back, the beta release of NetComber from IBM excited many OS/2 users. NetComber seemed promising, although very resource intensive. Like the Internet Adventurer, NetComber combines a number of different Internet client services into one package: IRC, Web browser, e-mail, and News. Netcomber's IRC is intuitive and straightforward to use.

At present, however, Netcomber is rather feature-poor. Among other

## Resources:

### GammaTech Internet Relay Chat 2.00 (\$49.95)

SoftTouch Systems Inc.  
(405) 947-8080  
Fax (405) 632-6537  
E-mail [72274.3102@compuserve.com](mailto:72274.3102@compuserve.com)  
Demo version at  
<ftp://ftp.ionet.net/pub/gammathec>  
READER SERVICE #104

### IRC/2 0.65 (\$55)

Innovative Logic Corp.  
(301)206-7692  
Fax (301)206-7692  
E-mail [irc2@invlogic.com](mailto:irc2@invlogic.com)  
Shareware version at <ftp://hobbes.nmsu.edu>  
READER SERVICE #105

### IRCII 3.00 beta (free)

E-mail [mikh@escape.com](mailto:mikh@escape.com)  
Latest version at <ftp://hobbes.nmsu.edu>

### PMIRC 1.07 (\$10)

Roger Bess  
E-mail [rbess@nando.net](mailto:rbess@nando.net)  
Latest version at <ftp://hobbes.nmsu.edu>

### Netcomber .9.7.6 beta (no charge at present)

IBM  
Latest version at  
<http://www.raleigh.ibm.com/ncr/>

### Internet Adventurer .20 beta (no charge while in beta)

Kim Rasmussen  
E-mail [kr@belle.dk](mailto:kr@belle.dk)  
Latest version at <http://www.belle.dk/kr/>

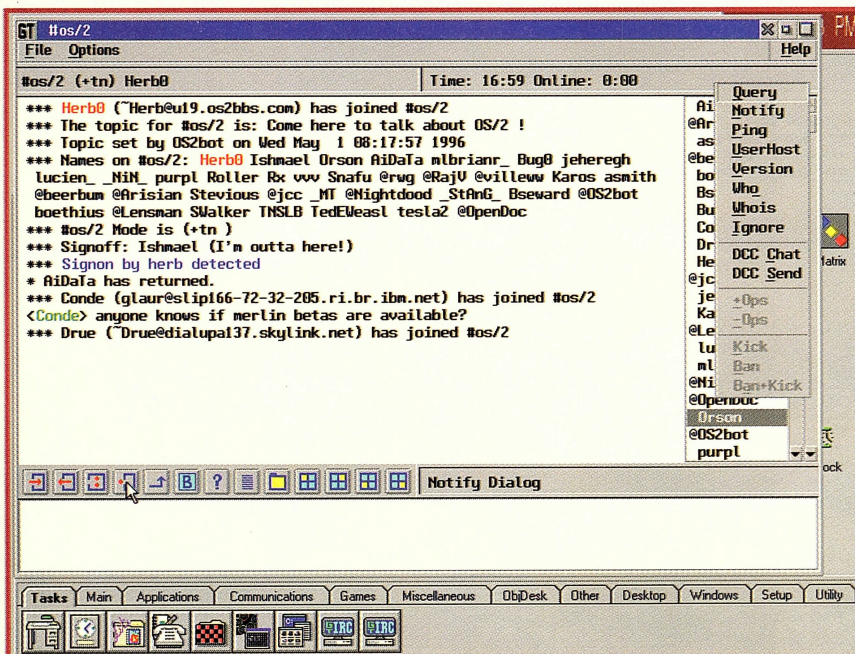


Figure 2: The GTIRC nickname list shows you who's in the chat room and who enters and leaves.



things, Netcomber does not support multiple channels at the same time, nor does it support DCC. In fact, unlike most IRC clients, Netcomber doesn't even support IRC command line operation for users who are familiar with IRC, limiting navigation to the sparse menu offerings. Netcomber has not seen any recent updates as of this writing, so it's not clear what IBM's intentions are.

A final—and recent—entry into the IRC arena is PMIRC, which, like GTIRC, supports multiple windows for different channels. PMIRC also provides right mouse button pop-up menus for additional IRC functions. One especially handy feature is the ability to right-click on a line in a channel window and get a `/whois` or `/version` report. Unfortunately, those reports only appear in the main IRC window.

While PMIRC does support private chats, it currently does not support DCC file transfers, nor does it support the use of scripts for automating IRC operations. Also missing is the ability to select text in the IRC win-

dow and copy it to the clipboard, which means that if someone tells you to check out a Web address, you'll need to copy the address by hand. However, at just \$10, PMIRC's price tag is considerably lower than the competition, and registration is optional.

### Bottom line

If the idea of chatting online in real time appeals to you, then you'll like IRC. For single-channel users who prefer the clean lines of text-based applications, one of the text-based IRC clients will appeal to you. If you want free, nonbeta software, your only guilt-free option is the freeware IRCII. Unfortunately, many users also assume that the fully functional, text-based IRC/2 is also free—it's not. If IRC/2 is your choice, it'll cost \$55 to register.

If you want the convenience of chat channels in multiple windows, then you'll need to move up to a PM client. At the moment, GTIRC is the only full-featured, nonbeta PM client. However, PMIRC shows promise, as

does the Internet Adventurer. Of course, there's also mIRC for Windows. If you like the convenience of placing windows anywhere on the desktop, however, then mIRC might not be for you, since windows are confined to the main mIRC window. If you spend a lot of time on IRC under OS/2, you likely will find GTIRC to be worth the \$50 price. **OS/2**

*Herb Tyson is a computer industry writer, analyst, and consultant. He is the author of several books, including Your OS/2 Warp Consultant, Navigating the Internet with OS/2 Warp, and Teach Yourself Web Publishing with Microsoft Word. He can be reached at [tyson@norloff.com](mailto:tyson@norloff.com).*

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# Connecting to OS/2 Sockets

Programming TCP/IP using C. By Steven J. Gutz

**T**he Internet is everywhere. I'm amazed by how many television commercials and newspaper advertisements contain World Wide Web addresses, even though the products being sold have nothing to do with the computer industry. Just watch the last few seconds of any automobile commercial and down in the fine print you will see a home page reference. The Internet is becoming ingrained in society and it cannot be ignored any longer.

Equally difficult to ignore is the fact that many software companies are investing great amounts of time and money to ensure that they are ready to meet the demands of this growing acceptance of the Internet. Companies such as IBM and Microsoft currently are dumping millions of dollars into Internet projects to stake a claim in the newest gold rush. Almost every software company is claiming that it has the ideal strategy to lead its customers to the next plateau of networking. So what's the big deal? Does TCP/IP development require these investments?

Of course not. In fact, anyone with an OS/2 compiler and a few additional tools can create intricate TCP/IP applications with relative ease. OS/2 Warp inherently provides the testing platform because it comes with a TCP/IP interface integrated into the operating system. Though a high-speed line is always nice, any Internet application can be successfully developed using OS/2 Warp's provided SLIP/PPP TCP/IP interface. You can even build and test applications without an Internet connection. If you have an FTP server running on your local system, you can use it to build and test a client on the same system.

When asked to write an article to introduce TCP/IP to OS/2 programmers, I developed an immediate sense of uncertainty. I am not really sure how I began writing TCP/IP applications for OS/2, nor do I have any immediate recollection of the pains I endured. I do remember

that the learning process was not as bad as most people perceive. For some odd reason, the near mention of socket programming sends normally firm application developers scattering in all directions. The goal of this article is to help any programmer who wants to write a TCP/IP application understand the method for doing so.

As you will see, building TCP/IP is not as complicated as you would think. Furthermore, OS/2 software—and more specifically TCP/IP applications—sells very well and can prove to be a very profitable undertaking. If you are writing any type of application, your time would be well invested if you enable your application for the Internet and intranet environments.

**Anyone with an  
OS/2 compiler and a  
few additional  
tools can create  
intricate TCP/IP  
applications with  
relative ease.**

## Tools of the trade

Contrary to popular belief, the toolset required to create stunning TCP/IP applets doesn't demand a major investment. All you really need is an adequate development system, a C/C++ compiler, and a TCP/IP development kit.

For a compiler, almost any of those currently available will work. My favorite is VisualAge C++; however, I have also successfully used Borland C++ (see "Working with the Borland Compiler") and Watcom C++ for TCP/IP applications. If you are on a budget, take a look at the GNU C/C++ compiler—it's completely free, and many people use it to create TCP/IP applications.

The last item needed is a suitable TCP/IP development kit. By far the easiest and cheapest way to obtain such a kit is through IBM's Developer Connection CD-ROM set. For a modest price, IBM will ship you a set of CD-ROMs that includes the complete documentation for Presentation Manager, many useful applications, and a limited license for the full TCP/IP development suite. The suite includes libraries, headers, files, and dozens of programming examples.



If you have OS/2 Warp Connect installed on your system, then you already own the development tools for TCP/IP, though they are stored in an obscure location on the distribution disc. Look in the `\cid\img\ibmpeer\ibm100n3\toolkit` directory for a file called *mptntk.zip*. This file contains all of the libraries and C header files you need, though you won't get any documentation or sample programs. Unzip this file to your hard drive and add the appropriate directory information to the **LIB** and **INCLUDE** lines in *config.sys*.

When linking TCP/IP applications, make sure to link in the necessary TCP/IP libraries. In most cases, you will need to link *so32dll.lib* and *tcp32dll.lib*, but you may need other libraries for more specific purposes, such as security.

## What is TCP/IP?

Before we dive into the programming aspects of this article, we need to determine exactly what constitutes TCP/IP. We only have room to scratch the surface here—if you want to learn more, you'll find many excellent books listed at the end of this article, ranging in complexity from easy to highly advanced.

TCP/IP is without question the single most popular networking protocol in the computer industry; it is supported on virtually every platform from the largest mainframe to the smallest notebook; it is the basic platform on which the entire Internet is based and is quickly becoming the backbone of choice for corporate intranets as well.

Using TCP/IP as a development platform is, of course, our mission today. You must understand the basic background and concepts before you can build any applications. The model for TCP/IP is remarkably simple, especially considering the power that it offers computer users.

TCP/IP was developed using a seven-layer architecture defined by the International Standards Organization, known as Open Systems Interconnection or ISO/OSI. Figure 1 illustrates the OSI model.

For the purposes of this discussion, an understanding of the various middle layers of this model is not necessary. You need only know that your network hardware (Ethernet, ISDN, modem) is at the lowest layer and you will be building applications at the top.

During the course of developing TCP/IP programs, you will also interface with the Presentation layer and perhaps some layers below it. Your interaction with these layers of code will be accomplished through the TCP/IP socket Application Programmer's Interface (API). As with most APIs, dozens of special-purpose calls can be used. However, we will use a very limited set of them in this article. The socket API is relatively standard across most platforms, and you should have little difficulty finding information on API calls not discussed here. IBM adopted the Berkeley socket interface, which is common to most UNIX implementations.

## Datagrams and packets

All communication in TCP/IP occurs between a client and a server using datagrams and streams. These are the basic units of information throughout TCP/IP. They consist of one or more data packets, which are transferred across the

Internet using the code in the TCP/IP Transport Layer. The data packets that make up a datagram or stream can be of virtually any size and typically include header and trailer data to control the delivery and accuracy of the data.

Packets travel between clients and servers using assigned data ports. A port is an end point for communication between applications; it typically refers to a logical connection and usually provides the capability to queue the data being transmitted or received. Specific port numbers have been reserved for most of the common protocols, though you can use any port number for any type of communications as long as

the server and client use the same one. News, for instance, uses port 119, but some Internet Service Providers (ISPs) use other nonstandard ports for News.

When the port number is combined with an Internet address, the resultant address is referred to as a socket address. Sockets addresses, the most common implementation of TCP/IP communications, are supported at two levels: at a low level called User Datagram Protocol (UDP) and at a higher level called Transmission Control Protocol (TCP). With UDP packet transmission, packets are sent and received in an unreliable fashion—only header and data checksums are provided, but no retransmission is performed for lost or erroneous data packets. TCP proto-

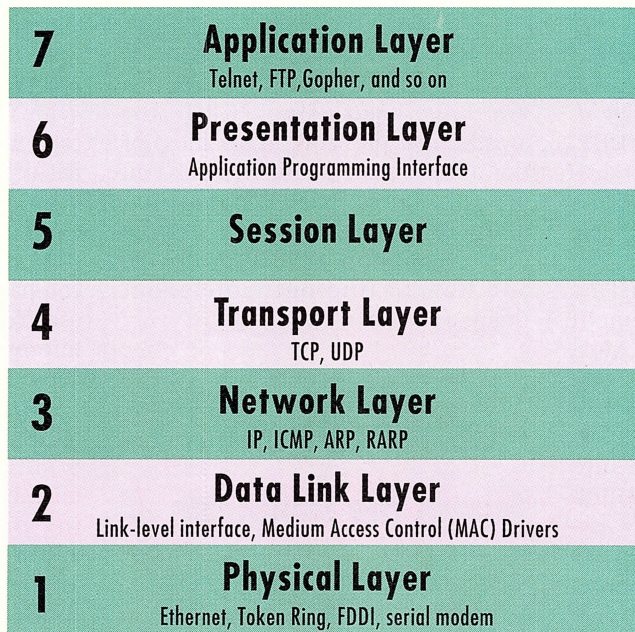


Figure 1: The ISO/OSI model for TCP/IP.



## Working with the Borland Compiler

There are a few "gotchas" with Borland's compiler, though after modifying a few header files, these can be avoided. You will need to insert a few additional **#defines** into one of the Borland header files. Where you do this is really not all that important as long as you ensure that the altered header file is loaded before any of the TCP/IP headers. For the Borland compiler the logical place to add these definitions is the *os2def.h* header, since this file gets included as part of any OS/2 project.

Using a text editor (the Borland IDE will do nicely), edit Borland's *os2def.h* file located in the include subdirectory of the Borland C++ installation. You will see a section of code as follows:

```
#if defined(__BORLANDC__)
#define APIENTRY      __syscall
#define EXPENTRY      __syscall
#define APIENTRY16    __far16 __pascal
#define PASCAL16      __far16 __pascal
#define CDECL16       __far16 __cdecl
#define FAR16PTR       __far16 *
```

```
#else
```

In this section, before the **#else**, add the following:

```
// Changes to use IBM TCP/IP
#define _Optlink      __stdcall
#define _Packed
#define _System       __syscall
#define _Export       __export
```

cols, such as NNTP News or Gopher, operate at a higher level than UDP. These protocols can perform retransmission in the event of packet loss and are generally much more reliable than UDP.

A number of methods exist by which a computer can implement TCP/IP at the physical layer. Most schemes typically involve a fast hardware solution like Ethernet or Token Ring, where a special hardware board has been inserted into the computer to provide communications at rates of 10 Mbits per seconds or faster. Many OS/2 Warp users have adopted much cheaper but slower implementations of TCP/IP, referred to as Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP). These implementations typically involve a modem connection via a telephone line to a local ISP. Once a connection is established, the computer is issued either a static IP address or one that is dynamically defined (different with each connection). If you want to find more detailed information about SLIP, refer to RFC 1055.

### TCP/IP protocols

TCP/IP is really a collection of protocols to provide various services. If

you have been using TCP/IP for awhile, you probably know most of the applications available, but you may not know what is happening under the covers. Let's look at some of the common TCP/IP protocols and how to find out more about them.

---

**We've highlighted a  
few of the hundreds of  
different protocols  
widely used on the  
Internet today.**

---

**HTTP.** Without question the World Wide Web is the fastest growing segment of TCP/IP applications. This family includes all of the "browser" tools, such as IBM's Web Explorer, Netscape's Navigator, and Spy's Mosaic, to name a few. Browsers communicate with a Web server using a protocol called

HyperText Transfer Protocol (HTTP). HTTP is a relatively simple command-based protocol. You can find a draft document describing it at <http://www.w3.org/pub/WWW/Protocols/HTTP/1.0/spec.html>.

**NNTP.** The Network News Transfer Protocol (NNTP) is the interface used to communicate with News servers. News is little more than a huge bulletin board system where users can post information and questions. NNTP is described in RFC 977.

**FTP.** The File Transfer Protocol (FTP) is an application-layer protocol that provides the capability to transfer data, files, and programs between hosts. FTP is built on top of the TCP protocol described previously, so it offers reliable transfer. RFC 959 details the FTP protocol and its various commands.

**Gopher.** The Gopher protocol is an application protocol developed at the University of Minnesota. Gopher is actually the precursor to the World Wide Web and offers most of the capabilities of the Web without the flashy interface. Though the Web has quickly eaten up much of the Gopher market, many power users still prefer it since it is incredibly fast compared to the Web and simple to use. You can find out more detailed information about the Gopher protocol in RFC 1436.

**Other Protocols.** We've highlighted only a few of the hundreds of different protocols widely used on the Internet today. Other emerging protocols include real-time audio (Internet radio), telephone, and even full-motion video. The limiting factor for most of these types of protocols is bandwidth. Still, once more users have ISDN or later, ATM connections, these and other even more intricate protocols will evolve.

### Major data structures

As mentioned previously, IBM uses the Berkeley socket interface. If you've been programming similar applications on a UNIX system, you'll already know most of the OS/2 API. A few differences exist, but they are minor.

Let's look at some of the TCP/IP API's internals. There are several very



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## Listing 1: A simple FTP program using TCP/IP API calls.

```
#define      INCL_DOS

#include <os2.h>
#include <stdio.h>

#include <types.h>
#include <sys\socket.h>
#include <netinet\in.h>
#include <netdb.h>

int main( void )
{
    int          iResult;
    int          iSocket;
    int          iPort = 21;                //
    FTP Port
    char  *szServer = "ftp.cdrom.com"; // Example server
    char  szBuffer[512];
    struct hostent  *pxtHost;
    struct sockaddr_in  xtSocket;

    // Initialize the socket for communications
    sock_init();

    // Resolve the host
    xtSocket.sin_addr.s_addr = inet_addr( szServer );
    if( (LONG)xtSocket.sin_addr.s_addr == -1 )
    {
        pxtHost = gethostbyname( szServer );
        if( pxtHost == NULL )
        {
            // Error getting host so terminate
            printf( "Error:Could not get host
information\n" );
            return -1;
        }

        bcopy( pxtHost->h_addr, &xtSocket.sin_addr,
pxtHost->h_length );
    }
    // Open a socket for this connection
    iSocket = socket( AF_INET, SOCK_STREAM, 0 );
    if( iSocket == -1 )
    {
        // Error getting socket so terminate
        iSocket = 0;
        printf( "Error:Could not create socket\n" );
        return -1;
    }

    // Connect to the correct port
    xtSocket.sin_family = AF_INET;
    xtSocket.sin_port = htons( iPort );

    if( connect( iSocket, &xtSocket, sizeof( xtSocket ) ) <
0 )
    {
        // Error connecting so terminate
        iSocket = 0;
        printf( "Error:Could not connect\n" );
        return -1;
    }
}
```

Cont'd on p. 36

good books that describe the API—remember these APIs are “almost” a standard, so don’t be afraid to open a UNIX TCP/IP programming guide.

Dozens of data structures are used by TCP/IP. One of the most essential is **sockaddr**, which is used by the system to store most addresses. It is defined as:

```
struct sockaddr
{
    u_short sa_family; /*
address family */

    char sa_data[14]; /* up to
14 bytes of direct address
*/
};
```

The **in\_addr** structure is used to store Internet-style addresses, and it’s embedded in the **sockaddr\_in** structure:

```
struct in_addr {
    union {
        struct { u_char
s_b1,s_b2,s_b3,s_b4; }
S_un_b;

        struct { u_short s_w1,s_w2;
} S_un_w;

        u_long S_addr;

        } S_un;
};
```

The **sockaddr\_in** structure is used to store the complete Internet address information for a socket, including the Internet-style address and the port number.

```
struct sockaddr_in
{
    short sin_family;

    u_short sin_port;

    struct in_addr sin_addr;

    char sin_zero[8];
};
```

The **hostent** structure contains information about the host system



(server) for the connection. This structure is used as part of the initial connection procedure and can then usually be discarded.

```
struct hostent
{
    char * h_name;
    /* official name of host */

    char **h_aliases;
    /* alias list */

    short h_addrtype;
    /* host address type */

    short h_length;
    /* length of address */

    char FAR * FAR *
    h_addr_list;
    /* list of addresses */

#define h_addr h_addr_list[0]
    /* address, for backward
    compat. */
};
```

The **servent** structure defines the details aspect of the server, such as the service name, and the port to which a connection will be made. This structure is also used as part of the connection process and can usually be discarded after the connection is completed.

```
struct servent
{
    char *s_name;
    /* official service name */

    char **s_aliases; /* alias
    list */

    short s_port;
    /* port # */

    char *s_proto;
    /* protocol to use */
};
```

## Common API functions

In spite of that fact many API func-

tions are supplied by the TCP/IP library, several of them are invoked for virtually every type of connection. In this section we will quickly study the more common function calls.

For a minimal program that uses these and a few other APIs, look at Listing 1, actually a *very* simple example of the FTP protocol. The program establishes a connection to an FTP server, sends two FTP commands, and terminates. The application itself is totally useless, but it will give you a basic framework from which to start.

**Socket.** The **socket()** function creates a new socket descriptor and returns it to the caller. It accepts and addresses family parameter, a socket type, and a protocol. The format of the function is:

```
SOCKET socket( int af, int
    type, int protocol );
```

**Connect.** The **connect()** function establishes a new connection with a remote host using the socket sup-

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that life offers  
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to work hard  
at something  
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## Listing 1: Cont'd from p.34.

```
//
// At this point we are connected and ready to go.
//
printf( "Connection successful!!\n" );

// Send a command and get a response
send( iSocket, "SYST\r\n", (short)6, 0 );
iResult = recv( iSocket, szBuffer, (short)512, 0 );
if( iResult > 0 )
    printf( "SYST Response String = %s", szBuffer );

// See ya!
send( iSocket, "QUIT\r\n", (short)6, 0 );
iResult = recv( iSocket, szBuffer, (short)512, 0 );
if( iResult > 0 )
    printf( "QUIT Response String = %s", szBuffer );

// Close the connection
soclose( iSocket );

return 0;
}
```

plied by the caller. A pointer to a **sockaddr** structure containing the network address and the port is also supplied so **connect()** knows where the remote host is located. The function prototype is:

```
int connect( SOCKET s, const
    struct sockaddr *name, int
    namelen );
```

**Send.** The **send()** function transmits bytes from the local system to the remote host using the connected socket. The format is:

```
int send( SOCKET s, const
    char *buf, int len, int
    flags );
```

**Recv.** The **recv()** function receives data from the remote host using the connected socket. In blocking mode, the **recv()** call will not return until at least one byte is received. This stricture can be a big problem if you are writing applications that will be executed on a computer attached to the network using an asynchronous line (modem). Once the call to **recv()** is invoked, there is no way to detect if the link is running. The result could be a program that is "hung," waiting for data that will never arrive. Nonblocking sockets are better for these applications. The format of **recv()** is:

```
int recv( SOCKET s, char
    *buf, int len, int flags );
```

**Soclose.** The **soclose()** function call frees the resources associated with the socket. This operation should be performed when the application no longer requires the sockets. The format of **soclose()** is:

```
int soclose( SOCKET s );
```

**Take a little extra  
time to really make  
your applications  
slick by integrating  
TCP/IP support.**

## Conclusion

We've quickly skimmed some of the more common aspects of TCP/IP programming for OS/2. Nothing described here should be very difficult to understand and this information represents about 80% of what you need to know to build any OS/2 TCP/IP client.

As you may have noticed, we completely skirted the issues of server programming. The server side of the TCP/IP connection does get a little more complicated because it involves supporting multiple client connections simultaneously.

There is no question that the Internet is everywhere today, and TCP/IP interfaces should be added to any application that you build. TCP/IP programming is no more difficult than Presentation Manager application development, so take a little extra time to really make your applications slick by integrating TCP/IP support. **OS/2**

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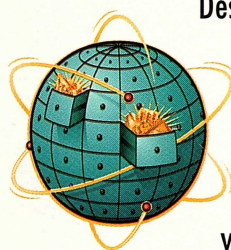
Requests for Comment (RFCs): descriptions of TCP/IP and Internet architectures are available for downloading from numerous Internet locations, including [ftp.cdrom.com](http://ftp.cdrom.com).

IBM TCP/IP on-line documentation is available as part of the TCP/IP SDK installation.

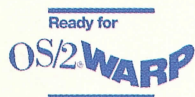
Steven Gutz is president of NeoLogic Inc., Pembroke, Ont., creators of the NeoLogic Network Suite for OS/2. He is also author of the recently released book, *TCP/IP Programming for OS/2*. You can contact Steve at [nstn4064@fox.nstn.ca](mailto:nstn4064@fox.nstn.ca).



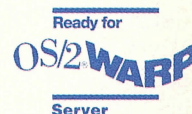
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# Event Programming in REXX

**How to move from command line to GUI design. By Merrill Callaway**

**W**hen you make the move from writing character-based REXX applications to developing advanced GUI-based programs, you'll learn an unpleasant truth: Coding an attractive and functional Presentation Manager (PM) application necessitates a great deal of extra programming. GUI code draws the windows, sliders, push buttons, menu items, and other interface objects. This code also controls these objects' logical behavior and appearance whenever "events" occur, such as when the user interacts with Workplace Shell Desktop objects via mouse or keyboard, or when the program outputs results.

The programming associated with nonsequential user (or program) interaction through a GUI is said to be "event driven" because certain specified events (such as a window opening, a mouse click on a pushbutton in the GUI, or program output) will trigger the execution of a set of instructions linked to that event. These linked instructions perform application engine tasks, trigger yet other events (which execute their own associated code), or directly change the appearance or behavior (called properties) of objects in the GUI.

While it is not necessary for every possible event in a GUI to have associated code, every object in a GUI does possess properties, attributes, or characteristics that describe the object's appearance and behavior—the exact nomenclature depends on which GUI builder you use, but these are more or less interchangeable terms. Every GUI object has a default set of properties, which you may determine at design time via the GUI builder interface notebooks.

At run time, your program code may get or set properties of objects dynamically. For instance, an entry field may have properties such as foreground and background color, value (text within the field), size, position, hidden or visible attributes, font style and size, read only, or forced justification. A value-set object may have attributes for each entry such as item type (text or color) or a numerical value. Properties like font style and size or entry field position are usually set only once at design time, whereas at run time, a property such as text value might repeatedly change as the program executes.

Functions used at run time to get or set properties or attributes are called methods. A method can be either

event driven, or it can drive other events. For example, clicking a pushbutton (an event) might execute code that contains a method to set the color of an object; but the same event might use a method to get the color of another object and, if it is a certain color, trigger another event. A newcomer to designing GUIs will marvel at how much interlocking complexity can be necessary for even a simple interface. The considerable thought required for a user-friendly interface is a direct result of the nonsequential, interwoven organization of event-driven code as well as the myriad properties (or characteristics or attributes) that can be programmed using various methods.

Plain REXX programs generally run in an OS/2 command window, with ASCII text input and output (a type of user interface commonly called a Command Line Interface or CLI). OS/2's REXX has no built-in graphics capability whatsoever, and, therefore, no GUI functions. However, REXX can register and use any number of external high-level function sets (called dynamically linked libraries or DLLs), some of which allow REXX to command low-level OS/2 GUI functions and objects. By means of these newly registered functions, a REXX program can interact with GUI objects and their associated events. A popular DLL is RexxUtil, included with OS/2, which gives REXX programs limited control over the Desktop objects and is useful for many system-oriented tasks.

That's fine, as far as it goes, but to construct a REXX application with a real PM GUI, you will need one of the commercial "visual REXX" GUI builder packages: Hockware's VisPro/REXX and Watcom's VX-REXX are popular. Both include not only the means to construct OS/2 GUI objects, but also the REXX methods to control the properties or attributes of the objects themselves, including sophisticated behavior properties such as drag and drop. These packages present an integrated development environment complete with tools to draw and arrange objects, an editor, and debugging/testing facilities. The advanced version of each product includes objects and tools for easy graph generation and database connections and queries.

### From CLI to GUI

The OS/2 Window **STDIN** and **STDOUT** (the standard input and output streams) are collectively called a com-



# Events in REXX

mand dialog because OS/2 commands or executing REXX programs let the user communicate with the computer via this two-way, text-oriented console window. In general, you construct a VX-REXX or VisPro/REXX PM GUI to replace any command dialogs your REXX program may have with the computer. In other words, your GUI usually replaces the standard I/O formerly handled by an OS/2 Window. Still, both packages will automatically open a console if your program calls for standard I/O (for example, it contains a SAY or PULL instruction). Whereas a console can only handle text I/O, dozens of other ways exist to convey information to or from a GUI using events and object properties.

## Program structure

A project in either VX-REXX or VisProREXX automatically generates REXX code for handling the GUI objects you have constructed, as well as a main program loop, which waits for an event to occur. If one of the events for which you have written program code occurs, then the associated section of code executes as an internal function (a subroutine), then returns to the main program loop to wait for the next event. The event loop proceeds to an exit routine as soon as an exit event occurs.

In both packages, event subroutines are edited separately, the RETURN instructions are inserted at their ends automatically, and they are all concatenated together into the final REXX program listing. This final ASCII listing may be built into a binary executable file. VX-REXX binaries require a freely distributable run-time DLL to execute, but VisPro/REXX executables can be built as a complete stand-alone (including the run-time DLL) or as a smaller file dependant on a separate run-time DLL. Subroutines, which can be called from anywhere in the program (called "subprocesses" in VisProREXX and "shared sections" in VX-REXX), can also be added and edited separately. Subroutines are handy places to put engine code that is called from more than one event. The default in both packages is for all subroutines to share all variables (they do not contain the keyword PROCEDURE to protect their variables).

## Learning to code

A good exercise is to construct GUI front ends for finished command-line REXX programs. The "engine," or application code, will have been written already, so you can concentrate on making the GUI handle input and output, and then attaching appropriate REXX code to the various possible events in the GUI. Sections of your original CLI code usually will correspond directly to GUI events and can be cut and pasted into the event subroutines with only slight modifications. This exercise will teach you the good practice of keeping GUI, engine code, and shared sections organized separately.

We will look at two examples of GUIs made for command line versions of REXX programs, one using

VisPro/REXX, the other using VX-REXX. Although differences in the details and nomenclature exist, working with either product proceeds in much the same way: develop/debug engine code in the CLI environment; construct the GUI; attach sections of engine code to events; code I/O by linking object properties and attributes to events and engine code; separate out shared sections (global subroutines); code error handling if necessary; and finally, test.

## HTML to ASCII converter

The president of our OS/2 User Group lamented how tedious it was to remove all the embedded HTML-format instructions from a lengthy Web document for use in a

### Listing 1: CLI to HTML ASCII converter.

```
/* H2A.CMD HTML to ASCII conversion. */
say 'Input HTML path/filename.'
pull input
filename=filespec('name',input)
drive=filespec('drive',input)
path=filespec('path',input)
parse var filename first '.'
outputname=first'.TXT'
output=drive||path||outputname
say 'Output file is' output
do while lines(input)
  line=linein(input)
  keep=''
  do until line=''
    parse var line first '<' '>' line
    if first \='' then keep=keep first
  end

  /* remove punctuation &quot; and &amp; from
     keep */
  /* &quot; */
  if pos('&quot;',keep) \=0 then do
    part1=''
    do until pos('&quot;',keep) = 0
      parse var keep part1 '&quot;' keep
      keep=part1||'22'x||keep
    end
  end
  /* &amp; */
  if pos('&',keep) \=0 then do
    part1=''
    do until pos('&',keep) = 0
      parse var keep part1 '&' keep
      keep=part1||'26'x||keep
    end
  end
  /* write to output file */
  c=lineout(output,keep)
end
say 'Results are in 'output
exit 0
```



## Listing 2: Drag-and-drop GUI for HTML to ASCII converter.

```

/* VisPro/REXX */

_VPAppHandle = VpInit()
if _VPAppHandle='' then exit
_VPAppReturn = 0

/* Open first form */
Parse arg topic
_VPMainWindow = VpOpenForm('', 256, topic)
if _VPMainWindow='' then do
    call VpMessageBox 0,'VisPro/REXX','Unable to open Main',
        'form. Verify that there is a Main form, that it has an',
        'id of 256 and that the form has controls within it.'
    signal _VPAppExit
end

do until (_VPEventCall='')
    _VPEventCall = VpGetMsg(_VPAppHandle)
    Interpret _VpEventCall
end
/* Terminate application */
_VPAppExit:
call VpQuit _VPAppHandle
return _VPAppReturn

/* ##256_FORM.1 */
256_FORM.1: /* Form events - Opened */
Arg window
/* max num items, type, rendering, moveok, copyok, linkok,
    default */
CALL VpWindow window,'SETFORMDRAGINFO',5,'Plain','
    Text','<DRM_OS2FILE,DRF_TEXT>',1,1,1,'COPY'
deletestring=''
return

/* ##256_FORM.7 */
256_FORM.7: /* Form events - Dropped On */
Arg window
do n=1 to vpdropinfo.0 /* number of objects dropped */
    filename.n=vpdropinfo.n.4
    path.n=vpdropinfo.n.3
    input.n= path.n||filename.n
    parse var filename.n prefix '.' suffix
    if translate(suffix) \= 'TXT' then
        outputname.n=prefix'.TXT'
    else outputname.n=prefix'.XXX'
    output.n=path.n||outputname.n
    do while lines(input.n)
        line=linein(input.n)
        keep=''
        do until line=''
            parse var line first '<' '>' line
            if first\='' then keep=keep first
        end
        /* remove punctuation &quot; and &amp; from keep */
        /* &quot; */
        if pos('&quot;',keep) \=0 then do
            part1=''
            do until pos('&quot;',keep) = 0
                parse var keep part1 '&quot;' keep
                keep=part1||'22'x||keep
            end
        end
        /* &amp; */
        if pos('&',keep) \=0 then do

```

Cont'd on p. 41

regular word processor document. Reformatting HTML into plain ASCII gave me an idea for a very simple REXX program.

With only a few exceptions (like **&quot;** for a double quote and **&amp;** for an ampersand), HTML embedded instructions are arranged inside pairs of pointed brackets: **<** and **>**. These brackets are easily removed using the powerful REXX parse instruction.

**HA2.CMD** (Listing 1) is a small REXX program that takes an HTML file (which we will assume ends in *.htm*), removes the HTML embedded commands, and outputs a clean file with the same name but with the *.txt* extension. The **FILESPEC()** function divides the input file name from the drive and path names and concatenates them together again into the output path and new file name.

Once the program takes the input file and determines the output file, an outer **DO WHILE LINES(input)** loop reads the entire input file, one line at a time. A variable, **keep**, is used to store the parts of each line we want to keep. This variable is initially a null string. An inner **DO UNTIL line=""** loop repeatedly parses the line until all the sections inside pointed brackets are removed. We make use of the fact that parsing on a pattern removes the pattern from the string.

In the statement **parse var line first '<' '>'** line, the variable **line** is divided into two sections: everything up to (but not including) the first bracket (**<**) is assigned to the variable **first** and everything following the second bracket (**>**) is assigned back to the variable, **line**; **line** gets smaller each time. When the pattern can no longer be matched, **line** is null and the loop finishes. Each time through the loop, one set of pointed brackets is removed. If the variable **first** is not null, it gets concatenated to the **keep** variable. At the finish of the loop, **keep** contains the mostly cleaned line. To replace all instances of **&quot;** and **&amp;** with the proper symbol, there are two more sections to find these patterns in the variable **keep**.

The testing involves the use of the REXX **POSITION** function, which has a syntax of **POS(needle, haystack, start)**. The default start argument is the start of the line, in position 1. If **POS()**



returns a nonzero number, then this number represents the position from the start of **haystack** where the pattern (**needle**) occurs. A zero return means the pattern is not there. Note the concatenations of **part1** of the line to the hexadecimal representation of a double quote, '22'x to avoid any confusing or tangled syntax involving nested quotes. Try cleaning one of your HTML files with this program to see the results.

## Drag and drop

The purpose of our VisPro/REXX GUI program is to get the file path and name as easily as possible; and what better way than to use drag and drop? All we really need is a window properly set up to receive text files dragged and dropped on it. Since VisPro/REXX does not allow an empty form to execute, the window must have at least one object besides the window itself. We used a text object with a message "Drop HTML files in this window," and a pushbutton that will delete the cleaned files. You could use a contain-

er to display the icons of the files you drop there, but for this exercise we decided to have the cleaned output files sent directly into the EPM editor, so there is no need to display the icons for the original files.

There are three events to program: program opening, drag and drop into the window, and clicking on the pushbutton. We want to hide the pushbutton until we actually have output files to delete, so at design time we uncheck the **Visible** box in its settings notebook. The window's **dropped on** event section contains the actual HTML-to-ASCII conversion code. Once drag and drop generates output, the pushbutton should appear (the drag-and-drop event changes its attribute to **SHOW**). If the pushbutton to delete output is pressed and the output files are erased, then the program hides it again. To code the **HIDE** method, just select the actual pushbutton object and drag it into the Clicked/Selected event edit window for the pushbutton. You can then select the **HIDE** method from a list in

a pop-up menu. Both VisPro/REXX and VX-REXX feature this convenient drag-and-drop coding!

And now, on to the main event: Choose the **Form** menu, then **When**, then the **dropped on** event. Paste the original command-line conversion code here and then make modifications. Although VisPro/REXX opens a separate edit window for each event, we are talking about the subprocedure of the finished VisPro/REXX listing (Listing 2) beginning with

```
/* ##256_FORM.7 */
```

```
256_FORM.7: /* Form events -  
Dropped On */
```

When this section finishes, it opens the EPM editor with all dropped files loaded and ready for editing. Important differences exist in the engine code because a proper drag-and-drop text converter should be able to have more than one file dropped into its window. For that we will add an outside loop and make some of the variables into compound stems to handle any number of files.

The window must be prepared by specifying information about what kind of objects to receive from a drag-and-drop event. We need to specify how many files can be dragged and dropped. We coded the program's **Open** event so that you can select from one to five HTML files, drag them into the window, and drop them. Use the **Form** menu. Select **When** and then **Opened**. The event window appears. Select the **Edit** menu in this window, then **Add**, then **Miscellaneous**, then **Set form drag info**. A **CALL** to the **VpWindow** method will appear. The **SETFORMDRAGINFO** method has several arguments: **max num items**, **type**, **rendering**, **moveok**, **copyok**, **linkok**, **default**. (The call should be all on one line.)

```
CALL VpWindow window, 'SET-  
FORMDRAGINFO', 5, 'Plain  
Text',  
'<DRM_OS2FILE,DRF_TEXT>', 1  
,1,1, 'COPY'
```

Change the maximum number of items from the default 1 to 5 to allow as many as five plain text files to be dropped.

## Listing 2: Cont'd from p. 40.

```
part1=''
do until pos('&','&') = 0
  parse var keep part1 '&' keep
  keep=part1||'&'||keep
end
end

rc=lineout(output.n,keep)
end
call stream output.n, 'c', 'close'
call stream input.n, 'c', 'close'
end n
outputstring=''
do i=1 to vpdropinfo.0
  outputstring=outputstring output.i
end i
/* Show item Delete Output Text Files1001 Push Button */
CALL VpItem window,1001,'SHOW'
deletestring=deletestring outputstring
'start epm' outputstring
return
/* ##256_1001.0 */
256_1001.0: /* Event Clicked/selected - Delete Output Text  
Files 1001 */
Arg window self
'del' deletestring
deletestring=''
/* Hide item Delete Output Text Files1001 Push Button */
CALL VpItem window,1001,'HIDE'

return
```



## Listing 3: ASCII character translator.

```
/* ASCII.CMD ASCII character translator */
/* Add REXXUTIL function SysGetKey */
SIGNAL ON HALT
CALL RxFuncAdd 'SysGetKey','RexxUtil','SysGetKey'
DO FOREVER
  answer='' /* clear character string */
  SAY 'Input: string. Ctrl-C to quit.'
  answer = SysGetKey('noecho') /* no screen echo */
  dec=c2d(answer)
  hex=c2x(answer)
  bin=x2b(hex)
  SAY ''
  SAY 'character string='answer
  SAY 'and is equivalent to:'
  SAY ''
  SAY 'decimal='dec
  SAY 'hexadecimal='hex
  SAY 'binary='bin
  SAY ''
END /* do forever */
HALT:
EXIT 0
```

Now let's code the event that takes place after the input file is dropped into the window. The conversion code is placed in the **Form When Dropped On** event window. Since we may have as many as five items dropped, some of the variables must become compound. When the drop occurs, certain elements of a special VisPro/REXX compound stem, **VPDROPIINFO**, are filled with data. According to standard REXX practice, **VPDROPIINFO.0** contains the number of items dropped. Our compound variables run from **n=1** to **VPDROPIINFO.0**. **VPDROPIINFO.n.3** contains the paths of appropriate files, while **VPDROPIINFO.n.4** contains their names. (We added a small safeguard against overwriting a file already ending in *.txt*. If that name exists, the program uses an extension of *.xxx* instead.)

When the loops finish, before the EPM editor can open with the output files loaded, the output files must be closed with the **STREAM()** function. The input files are also closed to make way for another set of input files without closing our window. A string of all output files is concatenated in a loop, and finally EPM opens with these files loaded. Since you may just want to read these converted ASCII files, a pushbutton appears to allow you to delete all the output files. The EPM editor remains

open until you close it, however.

To allow for multiple drags to this window, EPM uses the OS/2 command **START** to launch each instance separately. The output string (**outputstring**) is determined at each drag-and-drop event and reset to null once EPM loads the output files. The

delete string (**deletestring**) is initially null in the **Form Open** event. The delete string is a concatenation of all output strings until the delete pushbutton is pressed, at which time the delete string is reset to null. This useful program demonstrates simple events such as clicking a pushbutton and more complex events such as drag and drop and changing attributes dynamically at run time.

## ASCII character code indicator

*Ascii.cmd* (Listing 3) is a simple ASCII character code generator. The program registers and uses the **RexxUtil** function **SysGetKey()** to capture a keypress (including <Enter> and <Esc>), and convert and reveal the character's hexadecimal, decimal, and binary numeric codes. Knowing key codes comes in handy for all sorts of programming. For instance, in REXX you could use the hex code of a line feed (**0a**) and carriage return (**0d**) to break a line.

```
SAY 'First line of text' ||
  '0a0d'x || 'and second',
  'line.'
```

## Listing 4: GUI for ASCII character translator.

```
/*:VRX          Main
*/
/* Main
*/
Main:
/* Process the arguments.
   Get the parent window.
*/
  parse source . calledAs .
  parent = ""
  argCount = arg()
  argOff = 0
  if( calledAs \= "COMMAND" )then do
    if argCount >= 1 then do
      parent = arg(1)
      argCount = argCount - 1
      argOff = 1
    end
  end; else do
    call VROptions 'ImplicitNames'
    call VROptions 'NoEchoQuit'
  end
  InitArgs.0 = argCount
  if( argCount > 0 )then do i = 1 to argCount
    InitArgs.i = arg( i + argOff )
  end
  drop calledAs argCount argOff
/* Load the windows
*/
```

Cont'd on p. 44

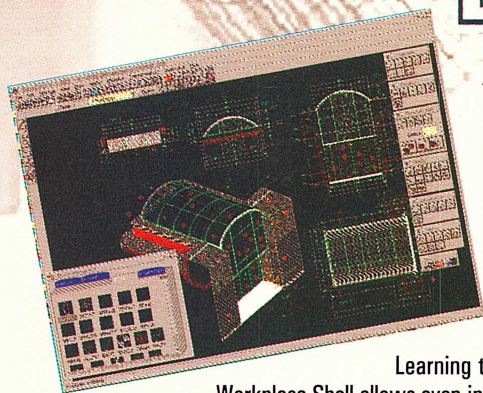




# Not All CAD Programs Are Created Equal

## BlueCAD

The power of 32-bit computing has finally been merged with sophisticated drafting tools to bring you an exciting new CAD solution. BlueCAD.

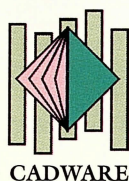


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Note the hex code format you must use in REXX. Decimal numbers would be treated as strings. The CLI program uses a **DO FOREVER** loop exited by a <Ctrl-C> halt. When <Ctrl-C> is pressed, the **SIGNAL ON HALT** instruction forces an orderly program branch to the **HALT:** label, rather than a standard interrupt with accompanying messages.

The VX-REXX GUI is composed of a window, a value set, five entry fields, and four descriptive text objects. Four entry fields are for character, hexadecimal, decimal, and binary equivalents, while the fifth entry field is for displaying additional information when a nondisplaying key such as the <Tab> or <Enter> key is pressed.

The most interesting object is the value set, a 15-row, 17-column table of ASCII characters, one of which is selected at all times. As each table entry is clicked, the character and its numeric equivalents appear in their respective entry fields. Some usually nondisplaying characters, such as Null, Tab, Enter, Space, Escape, and Line Feed also display their names in the fifth entry field. If you're not familiar with a value set, it's a set that contains values that can be set at run time by the **VRMethod()** function. These values are represented by a compound variable, the stem name of which is user-supplied. (See the **FillData:** section of Listing 4.) The stem is **character.** (note the period). The number of items to be set is given by **character.0=255**.

A **DO** loop from 1 to **character.0** (1 to 255) finds the character equivalent of the decimal code between 0 and 254. The variable **ascii**code is used to represent the ASCII code itself, and the **D2C()** built-in REXX function converts the character, which is then assigned to the appropriate value set entry, **character.n** (value set entries run sequentially from the upper left corner, across and down). This **FillData:** section executes once because it is called from the **Init** section, one of the automatically generated VX-REXX sections.

To make a shared section, just open the section window and use the menu to open and name a new section. I like to keep my own code

## Listing 4: Cont'd from p. 42.

```
call VRInit
parse source . . spec
_VREPrimaryWindowPath = ,
    VRParseFileName( spec, "dpn" ) || ".VRW"
_VREPrimaryWindow = ,
    VRLoad( parent, _VREPrimaryWindowPath )
drop parent spec
if( _VREPrimaryWindow == "" ) then do
    call VRMessage "", "Cannot load window:" VRError(), ,
        "Error!"
    _VREReturnValue = 32000
    signal _VRELeaveMain
end

/* Process events
*/
call Init
signal on halt
do while( \ VRGet( _VREPrimaryWindow, "Shutdown" ) )
    _VREEvent = VREvent()
    interpret _VREEvent
end
_VREHalt:
_VREReturnValue = Fini()
call VRDestroy _VREPrimaryWindow
_VRELeaveMain:
call VRFin
exit _VREReturnValue
VRLoadSecondary:
__vrlsWait = abbrev( 'WAIT', translate(arg(2)), 1 )
if __vrlsWait then do
    call VRFlush
end
__vrlsHWnd = VRLoad( VRWindow(), VRWindowPath(), arg(1) )
if __vrlsHWnd = '' then signal __vrlsDone
if __vrlsWait \= 1 then signal __vrlsDone
call VRSet __vrlsHWnd, 'WindowMode', 'Modal'
__vrlsTmp = __vrlsWindows.0
if( DataType(__vrlsTmp) \= 'NUM' ) then do
    __vrlsTmp = 1
end
else do
    __vrlsTmp = __vrlsTmp + 1
end
__vrlsWindows.__vrlsTmp = VRWindow( __vrlsHWnd )
__vrlsWindows.0 = __vrlsTmp
do while( VRIsValidObject( VRWindow() ) = 1 )
    __vrlsEvent = VREvent()
    interpret __vrlsEvent
end
__vrlsTmp = __vrlsWindows.0
__vrlsWindows.0 = __vrlsTmp - 1
call VRWindow __vrlsWindows.__vrlsTmp
__vrlsHWnd = ''
__vrlsDone:
return __vrlsHWnd
/*:VRX FillData
*/
FillData:
/* Fills value set with ascii character data */
ascii=0
character.0=255
DO n = 1 to character.0
    character.n=d2c(ascii)
    ascii=ascii+1
END
```

Cont'd on p. 45



(except for calls to other sections) separate from the automatically generated code. This safeguard makes editing less error prone and debugging easier. After you open this new section edit window, drag and drop the value set object into it. Choose **Values** and type in the name **character.** for your stem. The line with the **VRMethod** appears. The rest of this section code is entered manually. The programmer must create the compound variable values *before* the **VRMethod()** can set the attributes. The **character.0=255** line is important to show how many value set values to set, while **character.1** through **character.254** are the values themselves.

The call to **VS\_1\_Click** executes the value set click event code as soon as **FillData:** executes. Otherwise the null string message will not appear in entry field 5 at program start. The **VS\_1\_Click** section (see Listing 4) is basically our CLI code, except that the output has been replaced with **VRSet()** functions. The input is via the **VRGet()** method, which finds the index **i** of the selected item in the value set. This selected item is used as the tail of the compound variable. (Therefore, **character.i** is the value of the item selected. Recall that sections do *not* normally contain the REXX keyword **PROCEDURE**, and, therefore, these values are available globally.) The **SELECT** block sets the value of the extra entry field whenever certain codes are generated.

Now you know how to make a GUI for a simple command line REXX program in either VisProREXX or VX-REXX. There isn't room here for the code, but complex GUIs are just a matter of expanding on the basic ideas. If you keep your code modular, make incremental improvements to your modules, and remember to program every way one object affects another, you can create an interwoven PM masterpiece! **OS/2**

Merrill Callaway is the author/publisher of two REXX books, *The ARexx Cookbook (Amiga REXX)* and *The REXX Cookbook (OS/2 REXX)*, as well as a contributing editor and REXX columnist for *Amazing Computing*. He can be reached at [callaway@indirect.com](mailto:callaway@indirect.com).

## Listing 4: Cont'd from p. 44.

```
ok = VRMethod( "VS_1", "SetAttributes", "Values", "character." )
call VS_1_Click
return
/*:VRX      Fini
*/
Fini:
    window = VRWindow()
    call VRSet window, "Visible", 0
    drop window
return 0

/*:VRX      Halt
*/
Halt:
    signal _VREHalt
return

/*:VRX      Init
*/
Init:
    window = VRWindow()
    call VRMethod window, "CenterWindow"
    call VRSet window, "Visible", 1
    call VRMethod window, "Activate"
    drop window
call FillData
return
/*:VRX      Quit
*/
Quit:
    window = VRWindow()
    call VRSet window, "Shutdown", 1
    drop window
return
/*:VRX      VS_1_Click
*/
VS_1_Click:
i = VRGet( "VS_1", "Selected" )
ok = VRSet( "EF_1", "Value", character.i )
dec=c2d(character.i)
hex=c2x(character.i)
bin=x2b(hex)
ok = VRSet( "EF_2", "Value", hex )
ok = VRSet( "EF_3", "Value", dec )
ok = VRSet( "EF_4", "Value", bin )
select
    when dec=0 then
        ok = VRSet( "EF_5", "Value", "null string" )
    when dec=9 then
        ok = VRSet( "EF_5", "Value", "tab" )
    when dec=10 then
        ok = VRSet( "EF_5", "Value", "line feed" )
    when dec=13 then
        ok = VRSet( "EF_5", "Value", "carriage return" )
    when dec=27 then
        ok = VRSet( "EF_5", "Value", "escape" )
    when dec=32 then
        ok = VRSet( "EF_5", "Value", "space" )
    otherwise ok = VRSet( "EF_5", "Value", "" )
end
return

/*:VRX      Window1_Close
*/
Window1_Close:
    call Quit
return
```



"I want **MOVE** out of this  
Relationship."

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from my  
hard drive!"

Megan is feeling a little snubbed by her computer's hard drive. The reason? It's holding back on her, and she knows it. She paid for the whole hard drive. But the truth is, if you have a large hard drive, a lot of its capacity is being wasted due to inefficient storage methods.

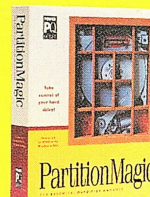
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## SOM 3.0: Lost in the Garden

BY ROGER SESSIONS



**M**onday, I got lost in a garden. I was so sure I knew exactly which path to follow that I didn't bother to look carefully at the trail markings. When I should have been in my hotel room, I was under a waterfall.

I stood under an outgrowth of rock while the water formed a perfect curtain before me. I was surrounded by plants that seemed vaguely familiar and smells that seemed connected to an earlier time. Finding my hotel room now didn't seem so important.

The Opryland Hotel in Nashville, Tennessee, is a series of buildings strung together like giant pearls on a string. To get from the main hotel to the conference rooms one must pass through the Conservatory, a very large, elaborate greenhouse. Actually, "greenhouse" fails to convey the scope of the Conservatory. The complex is almost a self-contained ecosystem with trails, brooks, flowers, trees, and the waterfall at which I had found myself.

I gave several talks at the IBM Technical Interchange about SOM (System Object Model) and distributed objects, and I made this nature trek many more times. Each time, I tried to retrace my steps back to the waterfall, but I was never again able to find this peaceful little spot. Perhaps it had been nothing more than my imagination. Several times during the week, I wondered if this interlude was symbolic of the IBM SOM strategy.

### SOM 3.0

Over the last several months, I have been feeling much better about SOM. In the past, I've criticized the

SOM marketing strategy. Since then, the SOM 3.0 beta has been made widely available on the IBM SOM-Objects Web site. All of the major hardware groups within IBM have announced plans to support SOM. IBM has set up a focused SOM marketing group under the leadership of Anthony Brown.

I've met Anthony Brown several times and have been impressed. The SOM brand manager assisting Mr. Brown is Chris von Schweinitz. Chris has been a strong advocate for porting SOM to other hardware platforms and is an effective spokesperson for SOM. Also assisting Mr. Brown is Rick Clark, manager of Object Marketing and Support. All of these people are very capable.

I called John Slitz, the IBM vice president of marketing for object-oriented (OO) technology and Mr. Brown's boss, just to make sure this group's future is secure. John assured me that having a marketing group completely focused on SOM is critical to the whole OO technology strategy, and that this group has his full support.

So for the first time, SOM's future seems to be in the hands of a group that understands its potential. Rather than presenting an inconsistent "SOM solves all the world's problems" story, we actually may have a group that is focused on the *raison d'être* of this product: distributed objects.

### SOM as a CORBA implementation

SOM 3.0 is first and foremost the industry's most complete implementation of the OMG CORBA specifica-

tion. The OMG (Object Management Group) is a consortium of hardware and software companies based in Framingham, Massachusetts. Its charter is to develop architectural standards for Distributed Object Computing (DOC).

I believe DOC is an exciting field, and over the next five years will become the technology of choice for doing distributed computing applications. SOM is one of the industry's leading DOC technologies. With SOM, IBM is well positioned to lead in this whole technology area.

The basic SOM architecture implements the OMG-defined CORBA (Common Object Request Broker Architecture). This architecture defines mechanisms for invoking methods on remote objects. I gave a general introduction to this architecture as implemented in SOM 2.1 in the April 1996 issue.

There are at least three reasons you might use a CORBA architecture. The first is that you want to use objects, but want them in a different process. That way, if they crash, they don't take you down with them. The second is that you want to invoke methods on an object, but the methods can be implemented more efficiently on another machine because, say, the methods need to access data on that machine. The third reason is that you want to share objects with other processes.

This third reason for using CORBA, sharing objects, is the most important from the perspective of DOC. When sharing objects, two or more processes make method calls on the same remote object. As one process updates the state of the re-



mote object (through remote method calls), those state changes are visible to other processes (also through remote method calls). If, for example, one process orders two tons of bigDog food from an inventory object and another process checks the amount of bigDog food on hand in that same inventory object, the second process will see the inventory reduction resulting from the first process's order.

SOM 3.0 has a number of important enhancements over and above SOM 2.1, the current version. First of all, it is the first version of SOM to support the CORBA IIOP (Internet Inter-ORB Protocol). This protocol specifies how different implementations of the CORBA architecture interoperate with each other. With IIOP support, SOM clients can invoke methods on objects living in non-IBM CORBA implementations, and vice versa.

## Object services

The second set of SOM 3.0 enhancements has to do with IBM's implementations of the so-called CORBA Services. This group of OMG-defined frameworks is intended to solve common programming problems in distributed applications. Let's take a look at some of these problems and the solutions CORBA offers.

The first problem is instantiation. Instantiating objects in a distributed-object system is a bit more complicated than instantiating objects in a simple single-process system. Traditional C++ programmers simply call for a new object of a given type to be created. Distributed programmers need to specify not only the type of the object, but also its location.

The process of instantiating objects is defined by the CORBA Life Cycle Service. In this model, objects are instantiated by special purpose objects called factories. A given factory object knows how to instantiate a given type of object in a particular process.

To find the appropriate factory object, we use a factory finder ob-

ject. A factory finder takes a description of what you want instantiated and where you want it instantiated, and finds a factory capable of doing that instantiation.

The Life Cycle Service is actually much less important than you might think. The reason is that in distributed applications most processes do not instantiate objects. Most use existing objects. Consider our two processes using an inventory object to order and track bigDog food. Neither process creates the inventory object.

---

**Millions of dogs  
all over the world depend on  
transactional systems  
for their health and well-being,  
as do bank customers  
(who are obviously  
much less important).**

---

One uses the inventory object to place an order. The other uses it to check inventory levels. If the second process instantiated a new inventory object, that object would have a new state that would not include the updates made by the first process. This state discrepancy, obviously, would defeat the whole purpose of the distributed application.

Web pages offer a useful analogy to a distributed object application. We do not—usually—create Web pages. Most of the time we are using existing Web pages, then moving on and using some new Web pages. The pages were there before we came, and they will be there for others to use after we are finished.

The next CORBA problem has to do with finding objects. If our two inventory processes want to invoke methods on this existing inventory object, they must somehow reach out into the CORBA ether and find

the object they want to use. The mechanism CORBA defines to find objects is the Naming Service.

The Naming Service can be thought of as a well-known black box. Everybody has a reference to the same black box. Anybody can insert an object into the black box and assign a name to that object. Anybody can ask the black box to find the object associated with a particular name, reducing the problem of finding shared, distributed objects to a much simpler problem of agreeing

on names. As long as I know the name of the inventory object, I can ask the Naming Service black box to find the inventory object.

Most distributed applications fall into one of three categories. *Initialization* programs are those that instantiate objects, assign names to them, and place them into the Naming Service. *Application* programs find and use these objects. Our inventory processes are such programs. The vast majority of programs will fall into this category. *Clean-up* programs do an ordered shutdown of a system. They remove the objects from the Name Service and de-instantiate the

objects, freeing up whatever resources the objects are using. The initialization and clean-up programs are run by system administrators. The rest of us will be running application programs.

The next CORBA problem has to do with discovering that something important has happened. Suppose, for example, we want to have two distributed objects working together. One is an inventory object that keeps track of stock levels of various items. The other is a supply object that knows how to bring in new supplies when stocks of a particular item run low. How does the supply object know when the inventory object is running low on some item?

The CORBA solution uses the Event Service. Objects have a defined mechanism for defining, raising, and noticing events. An object might, for example, define a low-bigDog-food event. The inventory



item will automatically raise this event. A supply object could be looking out for this event, and, when it "notifies" the event has occurred, jumps into action.

The Event Service divides objects interested in a given event into consumers and producers. A consumer is an object that wants to know the event occurred. A producer is an object that causes the event to occur. In our example, the supply object is the consumer, and the inventory object is the producer of the low-bigDog-food event.

The Event Service also supports two different programming models for events. In the pull model, the consumer continuously polls the producer to find out if the event occurred. In the push model, the producer tells the consumer the event has occurred.

It is possible, but unusual, for event consumers and event producers to communicate directly with each other. More often, they communicate through event channels. An event channel becomes an intermediary between consumers and producers. Event channels allow any number of objects to raise an event and any number of objects to notice the event. In our inventory application, we could have many bigDog-food suppliers watching for the low-bigDog-food event who start a bidding war as soon as the stock supply has gone down. They would do this by registering their interest in the low-bigDog-food event with the specific event channel coordinating the producers and consumers of low-bigDog-food events.

The Naming Service is a fundamental service that ties into both the Life Cycle Service and the Event Service. The Life Cycle Service builds its Factory Finder on top of the Naming Service. The Event Service uses the Naming Service to make its event channels known to the world. Anybody who would like to know about low-bigDog-food events would use the Naming Service to find, for example, the object named **OutOf-BigDogFood\_Event\_Channel**. Once one has a reference to the coordinating event channel object, one can register as either a consumer or a supplier of the relevant event.

## Late-Breaking News from the Object Front

IBM has recently announced an "agreement to collaborate" with IONA Technologies Ltd. IONA produces Orbix, one of the most successful products to compete with DSOM.

According to the press release "the announced collaboration with IONA provides expanded platform support for IBM's SOM technology and increases our customers' choices in platform deployment."

I have been asking all my IBM friends what this "collaboration" means technically, and nobody seems to know. So let me offer my own speculation. SOM offers a rich object model, a full implementation of many CORBA object services, and a relatively nonportable ORB (DSOM). Orbix offers a minimal object model, almost no CORBA object services, but a highly portable and successful ORB. The most logical merger between these two products is to replace DSOM by Orbix, keeping the SOM object model and object services and the Orbix ORB.

Should IBM follow this path, a significant delay of SOM 3.0 on all the IBM platforms would likely occur, assuming SOM 3.0 is where the merger will take place. Customers might also become wary of starting to prototype with the currently available beta SOM 3.0, given the widespread changes one can expect as these two products become one.

One of the biggest technical problems IBM will have to face in merging SOM and Orbix will be the SOM "thunk" technology. This technology was introduced in a somewhat misguided effort to support the Direct to SOM C++ compiler technology, and is the least portable part of the entire SOM kernel. My guess is it will have to go, which may put the entire Direct to SOM C++ strategy at risk. Personally, I don't feel this is a major loss, but others may not agree.

Although any merger between SOM and Orbix will cause a lot of short-term pain, the long-term gains could be significant. The merger could add some desperately needed platform coverage to SOM and help focus SOM on object distribution. It could improve Orbix's object model and object services story. Overall, I think this announcement may be good news, or at least could be once we figure out what the news really is.

The Persistence Service solves the basic problem of having objects coordinate their state changes with data in a database. Our inventory object would almost certainly need to update a corporate database to reflect changing supply levels.

Distributed objects do not necessarily need a Persistence Service to store data. An object can decide on its own either to refresh its data from a database or to update a database. But where applications need a standard interface to store data, the Persistence Service comes in very handy.

The Persistence Service is similar in concept to an object-oriented database. Both are able to store and restore object state. The Persistence Service differs in that it supports a wide range of underlying database products and data formats.

Object-oriented databases are

generally difficult or impossible to integrate with standard corporate databases and existing data formats. They offer little or no support for integration with existing applications. For these reasons, object-oriented databases have had little impact on corporate applications development, and, in fact, may have actually inhibited the adoption of object technology in this area. The Persistence Service, on the other hand, is specifically designed to work well with existing databases, data formats, and applications.

The Persistence Service needs some mechanism for moving data in and out of objects. This functionality is provided by the Externalization Service. The Externalization Service is based on a mechanism similar to C++ streams.

Most serious commercial appli-



cations need to work with objects within the context of traditional transactions. Suppose we have two inventory objects, one that represents a warehouse and one that represents a store. Let's say we have an order management system that moves inventory from the warehouse to the store. If our application fails between the removal from the warehouse and the receipt by the store, we have lost a heap of bigDog food. Not a happy state of affairs.

The Transaction Service ensures that either the bigDog food both leaves the warehouse inventory and enters the store inventory, or neither leaves the warehouse nor enters the store. Millions of dogs all over the world depend on transactional systems for their health and well-being, as do bank customers (who are obviously much less important).

In SOM, the Persistence, Externalization, and Transactional Services are closely related. Persistence uses Externalization to move data in and out of the object and coordinates its database update activity through the Transaction Service. A description of SOM 3.0 and the services related to persistence can be found in a brand new book called *Object Persistence: Beyond Object-Oriented Databases* by yours truly.

The SOM implementation of the Persistence Service ships with support for using the IBM relational database DB/2 as a datastore. This work was a fun collaboration between myself, then of IBM Austin, and Guylaine Cantin, then and now of IBM Toronto. I have tried to entice Guylaine away from IBM to ObjectWatch, but so far, no luck.

### Back to the waterfall

The implementation of the CORBA Services is an important milestone for SOM. It means that programmers can, for the first time, write truly CORBA-compliant distributed applications using IBM's products. Not only that, but SOM is the industry's most complete implementation of these CORBA services.

If SOM has the first decent CORBA implementation, and finally has its marketing group working well, why do I feel like I am searching for my lost waterfall everytime I

look at the IBM SOM strategy? The answer is simple: VisualAge.

IBM was trying to deal with a very real issue: lack of tools support for SOM. The response to this problem was to reorganize the SOM project under the Toronto tools group. This response shouldn't be too surprising. The standard IBM response to any problem is to reorganize. In fact, the standard IBM response to the new moon is to reorganize.

Placing SOM under Toronto tools definitely gave SOM some serious tools attention. It also put SOM near the VisualAge product line. VisualAge seems to be the class-library equivalent of a black hole, sucking in any framework that has the misfortune to cross its sphere of influence. SOM was no exception.

The current release of VisualAge includes about 500 classes (including SOM 2.1), most of which interoperate poorly, if at all, with SOM. According to John Slitz, the VisualAge scheduled for release next year will include over 2,000 classes, a four-fold increase over the current number. When John proudly made this announcement at the Technical Interchange, I believe a collective shudder ran through those of us who have actually had to deal with real class libraries.

Robert LeBlanc tells me not to worry, everything is under control. Robert is the object-oriented application development technology director. He owns VisualAge, SOM/DSOM, OpenDoc, and all of the SOM object services. First, he says that IBM will continue to make SOM widely available through other channels besides VisualAge, including the Web, at little or no cost. Second, he says that VisualAge is maturing into a well-designed tool for developing client-server applications, and that SOM is an absolutely critical foundation technology. Third, he says not to worry about the 2,000 class libraries. (I think he felt the shudder.) These classes will be organized into highly structured and layered frameworks, and most programmers will deal with only a small number of these classes.

I must admit to a bit of skepticism here. IBM has not done a great job integrating even 500 classes.

Now they are quadrupling the number. I'll be hoping for the best, but I'll believe it when I see it. When I asked Mr. LeBlanc what the recommended programming layer will be, he gave me the standard IBM answer: different layers for different players. In other words, the customers will have to sort this out.

So where are we with all this? It looks like SOM is well on the road to recovery. A good CORBA implementation. A good marketing organization. A lot of customer interest. But SOM is only one of a very large number of trails, brooks, trees, and flowers. And perhaps more than one waterfall. Let's hope it doesn't get lost in the garden. **OS/2**

*Roger Sessions is president of Object-Watch Inc., a company specializing in training and consulting in the use of SOM, DSOM, and related object-oriented technologies. He has spoken at over 30 conferences and has written extensively. His three books include the newly published Object Persistence: Beyond Object-Oriented Databases. Roger also publishes the SOMobjects Home Page (<http://www.fc.net/~roger/owatch.htm>) and an Internet newsletter called ObjectWatch on SOM. He can be contacted via e-mail at [roger@fc.net](mailto:roger@fc.net).*

### Resources:

Information on SOM and CORBA on the Web:

The SOMObjects home page, with pointers to many IBM and non-IBM SOM sites — <http://www.fc.net/~roger/owatch.htm>.

The OMG home page — <http://www.omg.org/>.

Kate Keahey's online tutorial to CORBA — <http://grouchy.cs.indiana.edu/hyplan/kksiazek/tuto.htm>.





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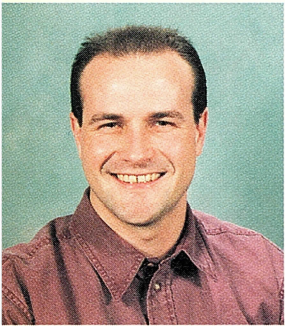
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## It's All In The Presentation

BY MARK BENGE AND MATT SMITH

**L**ast issue, we continued our look into custom controls, focusing on the CTLDATA of the control. This time we'll look at another area that is poorly documented—presentation parameters. These little critters allow you to add or change the colors and fonts of your controls.

### The other guys can't do this!

What makes OS/2 really special and a joy to work with is that someone was thinking when they created CTLDATA and presentation parameters. As we showed you last time, CTLDATA is a really powerful way

of implementing lazy programming techniques.

Presentation parameters, on the other hand, allow you to add color where it is needed and change the fonts to suit the circumstances.

In Windows, you can define a font, but only for the entire dialogue. To control the colors within most of the controls, you have to wait on a message sent by the system. You can't set the colors through the resources or other means, even in the much bally-hooed Windows 95. Makes you wonder what those kids in the northwest have been doing.

Table 1 shows the presentation parameters used by each of the differ-

ent controls within OS/2 Presentation Manager (PM).

As you can see, the same presentation parameter areas are used by various controls. You can use these areas in your controls or, as we will show you later, you can define your own special presentation parameters.

### Just how do they work?

Presentation parameters are funny little critters. They are maintained by OS/2 PM on behalf of each window. The basic premise of the presentation parameter is: index (or label) and corresponding value. Table 2 shows the presentation parameters defined in OS/2.

Table 1: Supported presentation parameters.

| Presentation Parameters | Controls |           |                 |           |           |      |       |                |           |             |      |
|-------------------------|----------|-----------|-----------------|-----------|-----------|------|-------|----------------|-----------|-------------|------|
|                         | Bitmap   | Check box | Circular slider | Combo box | Container | Edit | Frame | Graphic button | Group box | Handwriting | Icon |
| Background              | •        | •         | •               | •         | •         | •    | •     | •              | •         | •           | •    |
| Border                  |          |           |                 | •         | •         | •    |       |                | •         |             |      |
| Disabled background     | •        | •         | •               | •         | •         | •    | •     | •              | •         | •           | •    |
| Disabled foreground     | •        | •         | •               | •         | •         | •    | •     | •              | •         | •           | •    |
| Font name/size          |          | •         | •               | •         | •         | •    |       | •              | •         | •           |      |
| Foreground              | •        | •         | •               | •         | •         | •    | •     | •              | •         | •           | •    |
| Highlight background    | •        | •         | •               | •         | •         | •    |       | •              | •         | •           | •    |
| Highlight foreground    | •        | •         | •               | •         | •         | •    |       | •              | •         | •           | •    |



# GUI Corner

Before the **WM\_CREATE** message is received by a window, the presentation parameters have been processed and recorded by OS/2 PM. These include the parameters that are defined through the last parameter of **WinCreateWindow**.

Although you receive a pointer through the **CREATESTRUCT** structure to the presentation parameters set in the **WinCreateWindow**, other presentation parameters may not have been set. (Like we said, these are pretty weird critters.)

Presentation parameters can be inherited by a child window from its owner window, which is why the situation gets confusing.

For example, you can set the foreground color and text of a dialogue to yellow and 8 pt Helvetica by using **PP\_FOREGROUND**COLOR or **PP\_FOREGROUND**COLORINDEX and **PP\_FONTNAME**SIZE. Each OS/2 PM control will then display its text in yellow 8 pt Helvetica.

Essentially when each control is created, it queries the presentation parameters for itself using **WinQueryPresParam**. If the control

does not allow for inheritance, it uses a **QPF\_NOINHERIT** flag. The control can query for index or RGB colors by specifying which type is to be returned.

Generally, when you design your control, you have a set of colors in mind. For example, a pushbutton is composed of four colors: black, dark gray, white, and pale gray. These colors are used in five different areas: default border (black), border/shadow (dark gray), border/highlight (white), button face (pale gray), and button text (black).

The presentation parameters supported by the pushbutton are: foreground (text color), background (button face color), border (border/shadow), and font. The only color that is not accessible via presentation parameters is the default border.

The pushbutton caches either the colors defined for each presentation parameter or the default colors. When the button is drawn, these colors are used.

The only exception is for the font. The font face and size don't need to be cached by the control, because

OS/2 PM automatically selects the font and sets it as the current font for the presentation space, significantly reducing the amount of overhead the control needs to perform.

Along with the query API, OS/2 PM provides an API that allows you to set the presentation parameters at a time other than creation. **WinSetPresParam** allows you to set one parameter for the window in question.

The value that is set is dependent on the index. For example, if **PP\_FOREGROUND**COLOR is the index, the parameter is a **LONG** containing the RGB color. If **PP\_FOREGROUND**COLORINDEX is the index, the parameter is still a **LONG** but this time contains a **CLR\_\*** index value.

For most of the predefined presentation parameters, the parameter is a **LONG** value. The only exception is the **PP\_FONTNAME**SIZE, which is a string of the format **#.face** where **#** is the point size of the font and **face** is the face name. If you wanted to set the font to 8 pt Tms Rmn (the Times Roman raster font), you would use a string of **8.Tms Rmn**. The size of the parameter (which is the second argu-

| Controls |     |          |             |              |           |             |        |        |             |             |      |           |
|----------|-----|----------|-------------|--------------|-----------|-------------|--------|--------|-------------|-------------|------|-----------|
| List box | MLE | Notebook | Push button | Radio button | Rectangle | Scroll bars | Sketch | Slider | Spin button | System icon | Text | Value set |
| •        | •   | •        | •           | •            | •         |             | •      | •      | •           | •           | •    | •         |
| •        | •   | •        | •           |              |           | •           |        |        | •           |             |      | •         |
| •        | •   | •        | •           | •            | •         |             | •      |        | •           | •           | •    | •         |
| •        | •   | •        | •           | •            | •         |             | •      |        | •           | •           | •    | •         |
| •        | •   | •        | •           | •            |           |             |        |        | •           |             | •    | •         |
| •        | •   | •        | •           | •            |           | •           | •      | •      | •           | •           | •    | •         |
| •        | •   | •        | •           | •            |           |             | •      | •      | •           | •           | •    | •         |
| •        | •   | •        | •           | •            | •         | •           | •      | •      | •           | •           | •    | •         |



**Table 2: Presentation parameters list.**

|                                     |                                         |
|-------------------------------------|-----------------------------------------|
| PP_FOREGROUND_COLOR                 | Foreground RGB color                    |
| PP_FOREGROUND_COLOR_INDEX           | Foreground Index color                  |
| PP_BACKGROUND_COLOR                 | Background RGB color                    |
| PP_BACKGROUND_COLOR_INDEX           | Background Index color                  |
| PP_HILITE_FOREGROUND_COLOR          | Foreground highlight RGB color          |
| PP_HILITE_FOREGROUND_COLOR_INDEX    | Foreground highlight Index color        |
| PP_HILITE_BACKGROUND_COLOR          | Background highlight RGB color          |
| PP_HILITE_BACKGROUND_COLOR_INDEX    | Background highlight Index color        |
| PP_DISABLED_FOREGROUND_COLOR        | Foreground disabled RGB color           |
| PP_DISABLED_FOREGROUND_COLOR_INDEX  | Foreground disabled Index color         |
| PP_DISABLED_BACKGROUND_COLOR        | Background disabled RGB color           |
| PP_DISABLED_BACKGROUND_COLOR_INDEX  | Background disabled Index color         |
| PP_BORDER_COLOR                     | Border RGB color                        |
| PP_BORDER_COLOR_INDEX               | Border Index color                      |
| PP_FONT_NAME_SIZE                   | Font face and size                      |
| PP_FONT_HANDLE                      | Not used                                |
| PP_RESERVED                         | Reserved                                |
| PP_ACTIVE_COLOR                     | Active RGB color                        |
| PP_ACTIVE_COLOR_INDEX               | Active Index color                      |
| PP_INACTIVE_COLOR                   | Inactive RGB color                      |
| PP_INACTIVE_COLOR_INDEX             | Inactive Index color                    |
| PP_ACTIVE_TEXT_FGND_COLOR           | Text foreground active RGB color        |
| PP_ACTIVE_TEXT_FGND_COLOR_INDEX     | Text foreground active Index color      |
| PP_ACTIVE_TEXT_BGND_COLOR           | Text background active RGB color        |
| PP_ACTIVE_TEXT_BGND_COLOR_INDEX     | Text background active Index color      |
| PP_INACTIVE_TEXT_FGND_COLOR         | Text foreground inactive RGB color      |
| PP_INACTIVE_TEXT_FGND_COLOR_INDEX   | Text foreground inactive Index color    |
| PP_INACTIVE_TEXT_BGND_COLOR         | Text background inactive RGB color      |
| PP_INACTIVE_TEXT_BGND_COLOR_INDEX   | Text background inactive Index color    |
| PP_SHADOW                           | Shadow RGB color                        |
| PP_MENU_FOREGROUND_COLOR            | Menu foreground RGB color               |
| PP_MENU_FOREGROUND_COLOR_INDEX      | Menu foreground Index color             |
| PP_MENU_BACKGROUND_COLOR            | Menu background RGB color               |
| PP_MENU_BACKGROUND_COLOR_INDEX      | Menu background Index color             |
| PP_MENU_HILITE_FGND_COLOR           | Menu foreground highlight RGB color     |
| PP_MENU_HILITE_FGND_COLOR_INDEX     | Menu foreground highlight Index color   |
| PP_MENU_HILITE_BGND_COLOR           | Menu background highlight RGB color     |
| PP_MENU_HILITE_BGND_COLOR_INDEX     | Menu background highlight Index color   |
| PP_MENU_DISABLED_FGND_COLOR         | Menu foreground disabled RGB color      |
| PP_MENU_DISABLED_FGND_COLOR_INDEX   | Menu foreground disabled Index color    |
| PP_MENU_DISABLED_BGND_COLOR         | Menu background disabled RGB color      |
| PP_MENU_DISABLED_BGND_COLOR_INDEX   | Menu background disabled Index color    |
| PP_SHADOW_TEXT_COLOR                | Shadow text RGB color                   |
| PP_SHADOW_TEXT_COLOR_INDEX          | Shadow text Index color                 |
| PP_SHADOW_HILITE_FGND_COLOR         | Shadow foreground highlight RGB color   |
| PP_SHADOW_HILITE_FGND_COLOR_INDEX   | Shadow foreground highlight Index color |
| PP_SHADOW_HILITE_BGND_COLOR         | Shadow background highlight RGB color   |
| PP_SHADOW_HILITE_BGND_COLOR_INDEX   | Shadow background highlight Index color |
| PP_ICON_TEXT_BACKGROUND_COLOR       | Icon text background RGB color          |
| PP_ICON_TEXT_BACKGROUND_COLOR_INDEX | Icon text background Index color        |

ment of the **WinSetPresParam** API would be 10, which is the length of the string including the NULL terminating character.

## But how do I know when?

Given that we know we can set a presentation parameter at any time, do we have to query the presentation parameters before we paint each time? No, we don't; when a presentation parameter is changed after the window is created, a **WM\_PRESPARAMCHANGED** message is sent to the window.

The first message parameter (**mp1**) contains the presentation parameter index of the presentation parameter that has changed. Only those parameters that are handled by the window need to be checked. Again, like during the **WM\_CREATE** message, you have to use the **WinQueryPresParam** API to determine the value of the presentation parameter.

The **WM\_PRESPARAMCHANGED** message is also received when a presentation parameter is removed. The **WinRemovePresParam** API is used to perform this task. Therefore, when the **WM\_PRESPARAMCHANGED** message is processed, you do not know whether a presentation parameter is being set or removed.

A special condition needs to be mentioned with the **WM\_PRESPARAMCHANGED** message. When you drop a scheme palette on the window that owns a control, the **WM\_PRESPARAMCHANGED** message is sent to one instance of each control type. The **mp1** value, which is the presentation parameter index, is zero (0). The first defined presentation parameter is **PP\_FOREGROUND\_COLOR**, which has a value of 1.

Therefore, you need to process this index as best you can. In most cases, the presentation parameter will not have changed. Instead, a system color or font will have changed. Interestingly enough, the **WM\_SYSCOLORCHANGE** message is not received when you drop the scheme palette on the window.

## Wait, there's more!

Now, you may be thinking that you can set the presentation parameters only for OS/2-PM-defined indexes. However, that isn't the case. You can



indeed define your own presentation parameters and values. Remember, we touched on the fact that the value of the presentation parameter is not of a fixed size or content. In essence, you can define the contents of the presentation parameter to be almost anything.

In the case of our bar chart, we will create a new presentation parameter that will be used to set the color of the bars. The index we use for the interior color of the bars is `PP_USER + 0`. The index we use for the bar outline is `PP_USER + 1`.

In our control, we have an internal function `IGetPresParam`, which is designed to query for a specified presentation parameter and, if one isn't found, set the color to a predefined value.

We still use this function to access our private presentation parameters. We add new statements in the `WM_CREATE` and `WM_PRESPARAMCHANGED` messages to handle the new presentation parameters. That's it. It really is quite simple.

## Rules of the road

Some basic rules to understand with presentation parameters are:

- Presentation parameters are stored on behalf of your control or window.
- Handle only those presentation parameters of interest.
- Query for the presentation parameters both during the `WM_CREATE` message and when you receive a `WM_PRESPARAMCHANGED` message. Cache the values for use when painting.
- Support both index and RGB colors. Emphasis should be placed on RGB because you will have more colors to play with in RGB versus the 16 index colors.
- Start your index for private presentation parameters at `PP_USER`.
- Make sure that you include the proper length for `PP_FONTNAME-SIZE` so that the `NULL` character is accounted for—otherwise the control may explode.
- The presentation parameter you define doesn't deal with just color and font: the value can be virtually anything. In fact, bidirectional language support uses presentation

parameters to define bidirectional presentation characteristics.

## Stay tuned, don't change that channel

Next issue, we'll explain the inner workings of increasing a control's performance. We will also touch on such issues as painting and style handling. **OS/2**

## Acknowledgments

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*Mark Benge, IBM Software Solutions, RTP, N.C., is a staff programmer who joined IBM in 1989 and has worked on various CUA '91 controls for OS/2 2.x. Mark has a B.S. in computer science from Western Carolina University and can be reached at [banzai@raleigh.ibm.com](mailto:banzai@raleigh.ibm.com).*

*Matt Smith, Prominare Inc., Toronto, Ont., is lead architect for Prominare Designer and Prominare Validator as*

*well as the new IBM Universal Resource Editor. He has been involved with OS/2 since 1988, and can be reached at [msmith@prominare.com](mailto:msmith@prominare.com).*

## Resources:

You can download `ctrl3.exe` from these electronic sources:

CompuServe's OS2AVEN forum (OS/2 Magazine Section).

File area 11 on the IBM PCC BBS, (919) 517-0001, OS/2 Tools section on the OS/2 BBS for IBM TALKLink customers.

FTP to [prominare.com](http://prominare.com) and log in as anonymous. The source is located in the `/pub/prominare/guicornercodecache` subdirectory.

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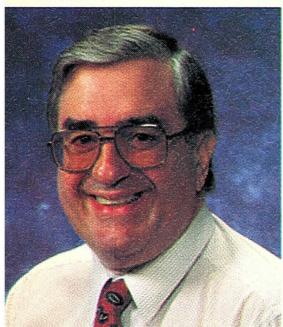
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## MKS Source Integrity 7.1c

BY GUY SCHARF

**C**onfiguration management (CM) is essential for keeping track of files, changes to files, and reasons for those changes. CM systems allow you to recreate files as they existed at an earlier point in time without having to keep complete copies of old versions. With Source Integrity 7.1c, Mortice Kern Systems Inc. (MKS) finally offers a native OS/2 Presentation Manager interface to its CM system. MKS Source Integrity offers version-control functions for saving and recovering revisions, locking to detect or prevent two programmers from simultaneously changing a file, descriptive labeling of revisions, and comparing and merging versions.

With Source Integrity, you organize files into projects. You check files in and out individually, in groups, or as an entire project. For each source file, you create an archive file. The archive file holds the latest version of the file, a record of all changes made to the file so that prior versions can be reconstructed, and comments about those changes. Each change has a revision number, date, label, author, keywords, and description. Each revision also has a state. A promotion feature allows you to manage files based on a file's current state.

Different versions of files often exist to meet different needs—a source file might be customized for a particular customer, or for an operating system, or for a release of a product. MKS Source Integrity supports these versions as branches of a file. For example, you might have versions 1.1 through 1.5 of a file. If a customized version was derived from

version 1.4, a new branch would be created as version 1.4.1. Later, you could merge this branch back to the main line or keep it as a separate line of development.

A Source Integrity NetWare Loadable Module (NLM) provides NetWare users with additional security and access control for archives maintained on a NetWare server.

I examined MKS Source Integrity using OS/2 Warp Connect. I did not examine the NLM functions.

### Ease of use

MKS Source Integrity includes both graphical and command-line interfaces. The character-mode and GUI components are shipped on six disks and must be installed separately. Installation requires approximately 6.6MB of disk space. You need to install both character-mode and GUI components. The optional NLM-security module is on a separate disk.

Before creating a project, you should examine the configuration screen and decide how you want to set up your project and archive files. If you have a large networked installation with many programmers, strict locking may be desirable to prevent two programmers from altering the same file. For a smaller or less formal shop, you may not want this option. Archives can be compressed to save space and encrypted for security. If you choose to encrypt the archives, you must supply the password whenever you use the archives. Be careful not to forget the password; MKS says that the files cannot be recovered without the password.

By default, MKS Source Integrity places the archives in an rcs directory below the source directory. You can also use an archive tree parallel to your source tree but with a different base directory or on a different drive. If you plan to use the promotion option, you enable that here. Source Integrity will optionally log every file check-in or check-out. As a nice plus, you can define the format of the log file.

To create a project, press the New Project button on the toolbar and fill in the form. You can add files to the project now or later. If you are currently using PVCS or SCCS, command line conversion utilities will convert your PVCS and SCCS archives to Source Integrity format. After you have added files, checking a file in or out is as simple as pressing a button on the toolbar. If your project is very large, you can create subprojects to divide the project into logical components. The developers can then work with individual subprojects rather than working with the entire application. You might use a subproject for a separate DLL or for a separate program in an application with several programs.

Sandboxes allow several programmers to work on the same project without simultaneously modifying the same project directory. A sandbox contains a programmer's private copy of some or all of the source files of an application. When the programmer checks the files back in from the sandbox, the master copy of the file in the project directory is automatically updated.

When you open a project, MKS Source Integrity scans all files in the



# OS/2 Toolbox

project and marks the files that have been changed. Select a file, press the Check-In button, and a Check-In dialog is displayed (Figure 1). The revision number is set to the previous revision plus .1, but you may increase it if desired. The State field allows you to group files together for promotion. The label is an arbitrary string with which you can identify a change. During maintenance, you could record a defect code here. You can use the Description field to record a longer description of the changes in a revision.

With event triggers, you can take special action when a file is added, or checked in, or when almost any other change is made to a project. For example, you could perform special checks before allowing a file to be checked in, or you could notify someone when a project is created.

Controlling source code by checking files in and out is only part of what you need as a developer. You must also be able to examine how files have been changed. MKS Source Integrity includes an excellent visual-difference program that will compare different versions of a file, or different files, and highlight the differences. The **diff** command line utility provides a useful text-difference file. The **merge** program nicely merges two diverging lines of code back together. (For more information on these utilities, see OS/2 Toolbox: "Guidelines for Programming," June 1996, pp. 56-59.)

Finally, you need to be able to build a product. The graphical interface will scan a file for all dependencies. The software examines dependencies recursively to find every file on which a program depends. A **build** option invokes **make** for your project. You can customize the command line and directory.

I found it easy to set up a project and archives. The

graphical interface served my regular needs for checking files in and out. I used the command line programs for special maintenance and to examine the detailed history of changes to programs.

## Documentation

MKS Source Integrity comes with four manuals: *Getting Started* (28 pages), *Reference* (294 pages), *Make* (132 pages), and *Windows* (188 pages). The *Reference* manual describes the command line interface; the *Windows* manual describes the graphical interface. While the manual is written for Windows, it describes the OS/2 version well. Screen layouts for the OS/2 and Windows versions are nearly the same. The manuals are more than just reference manuals; they are organized around the basic concepts and focused on how to achieve results.

MKS Source Integrity includes online help. The Help panels are complete, well-oriented towards OS/2, and include pictures of the screens being described. The panels have all of the buttons and controls

provided by the **view** program for **.inf** files. These navigation buttons are an unusual feature for an application, because they allow you to use the help file as an online manual. However, the <F1> key does not display help, making it difficult to get direct help for a field or a menu item.

## Warts and blemishes

The GUI does not provide 100% of the functionality offered by the command line version. For example, only the command line utilities will change the locking mode of an archive, display the complete history of revisions to an archive, or convert SCCS or PVCS archives to MKS Source Integrity format. The command line functions clearly show their UNIX heritage—they have a seemingly endless number of single-letter options. Unfortunately, MKS did not include an **.inf** file documenting the command line functions, so you must use the more limited **man** command to display the manual pages for a command line function.

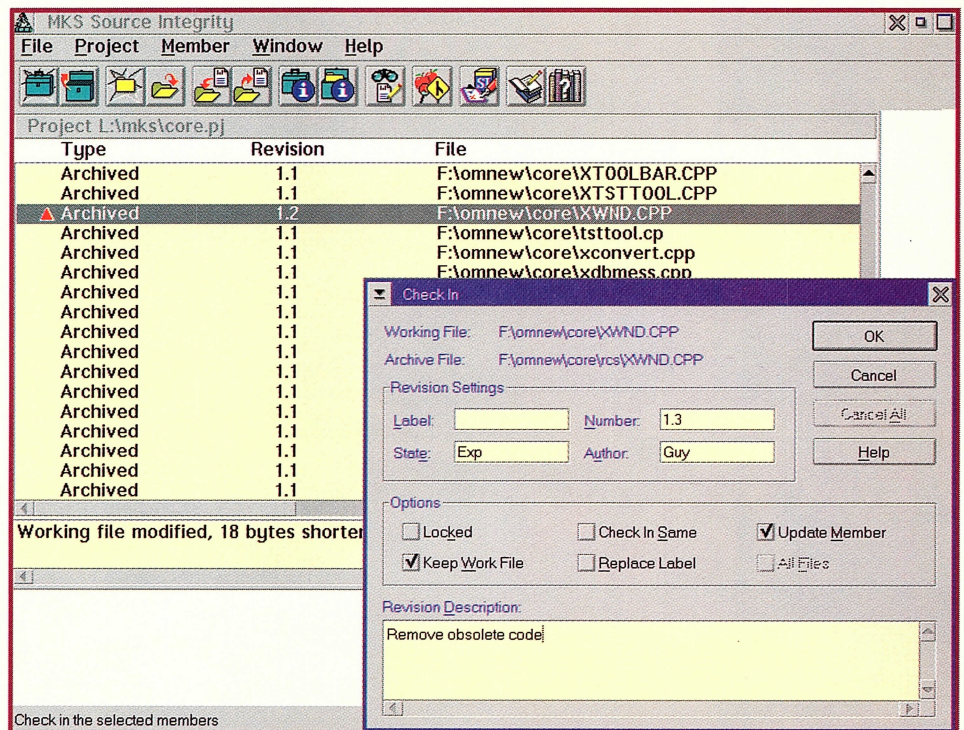


Figure 1: MKS Source Integrity file.



The **make** utility is POSIX.2-compatible and requires that each command line for a rule begins with a tab and not a blank. I prefer using blanks instead of tab characters in my files and find this requirement intensely annoying. The mistake of having a blank instead of a tab is so common that the manual explicitly mentions it as a common cause of errors.

I found the dependency scanner to be unsatisfactory. It was unable to handle large dependency lists or files with nonstandard extensions. When I used it to produce a dependency list in a **makefile**, the resulting file was a pale shadow of the real dependencies.

The Reports menu item simply creates a set of comma-separated files that you can import into a database or spreadsheet. While this feature gives you the flexibility to produce any kind of report you might want, the lack of any prepared reports means that some work is required to get any reports at all.

The GUI is not always a well-

behaved Presentation Manager (PM) application. For example, while adding members to a project, the PM queue is blocked, and the system cannot be used to do other work, which is inconvenient if you are adding many members. Neither the New Project nor the Add Members dialogs made it easy to add large numbers of files based on wild-card selection. I did not find the GUI interface convenient to check in large numbers of files. I would have appreciated a means to check in all files with the same comments; instead, I was presented with a dialog for every file.

While I liked being able to read the help file as if it were an **.inf** file, I missed having the <F1> key for specific help.

## Technical support

Support is offered free by e-mail, fax, or BBS. Telephone technical support is free for 30 days after your first call. Additional telephone support can be purchased.

## Summary

MKS Source Integrity is easy to use and configure. The graphical interface is effective without being overly complicated. With their extensive options, the command line utilities provide the additional functions required for special tasks. Availability of MKS Source Integrity for Windows, Macintosh, and UNIX may be a plus for some developers. The visual-difference utility is a delight. I'd happily use this tool to manage a development project.

## Comparing Files

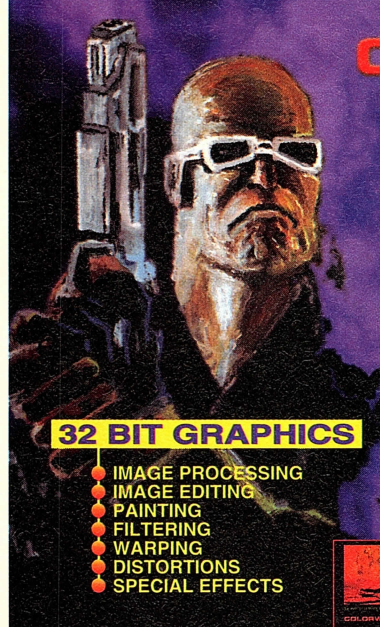
Several readers have asked where to find the Graphical File Compare (**gfc.exe**) utility I mentioned in my last column. This program is IBM Employee-Written Software and can be found in most collections of OS/2 file utilities as **os2gfc.zip**. You can download this file from the CompuServe OS2USER forum, in library 23, IBM Files. You can also get it from many FTP sites on the Internet. I found it at [software.watson.ibm.com](http://software.watson.ibm.com) as **/pub/os2/ews/os2gfc.zip** and in **/os2/diskutil/os2gfc.zip** on [ftp.cdrom.com](http://ftp.cdrom.com) or on Hobbes. Enjoy! **OS/2**

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Guy Scharf is president of Software Architects Inc., a software development firm specializing in developing OS/2 Presentation Manager applications for vendors and business. He can be reached by e-mail at [guy@swarc.com](mailto:guy@swarc.com).

## Resources:

### MKS Source Integrity 7.1c (\$499)

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# Seagate Expert Professional

SEAGATE BACKUP PERSONAL EDITION 2.0, DBEXPERT 2.0.1

BY BRIAN PROFFIT

## Seagate Backup Personal Edition 2.0 (formerly Arcada Backup)

**N**ot so long ago, the number of options available to OS/2 users looking for tape backup software was quite limited. I'm delighted to say that is no longer the case, at least for those with floppy- or parallel-port-based tape drives. Seagate Technology, long known for its disk drives, has entered the software business with the formation of Seagate Software, based on a merger between Arcada Software and Palindrome. One of the first results was the re-release of Arcada Backup as Seagate Backup.

### Quick start

After installation, you are automatically led through a nice introduction to the capabilities and usage of the product. The installation routine also attempts to detect your tape drive—it successfully located the Iomega 3200 tape drive that I had attached to LPT2. During installation, you also

have the option (which I strongly suggest you use) to create emergency restore disks. These disks will boot OS/2 and load the necessary device drivers to restore files from tape—a critical capability if your drive crashes or if you upgrade to a new hard disk.

Seagate Backup comes in several parts (Figure 1). These icons represent a high level of flexibility. Newcomers will appreciate the backup and restore wizards included to guide you through the process. Power users will appreciate the ability to go directly to the notebooks and dialogs that control all settings. The process is based on "backup definitions," each of which is a collection of settings and file names that completely define a backup process. The default backup definition created during installation contained all partitions, both FAT and HPFS, on my fixed disk. A backup definition template is included as well, so you can create as many custom backup definitions as you need.

The file selection dialog is based on the familiar tree view of a drive's contents. There is no obvious way to

select files to backup based on wildcards, such as \*.exe. If, however, you have become so indoctrinated with the Workplace Shell that you tend to use the right mouse button to search for pop-up menus, even when there doesn't appear to be a good reason to try it, you'll discover a way to enter include/exclude filters for file names.

Interestingly enough, Seagate Backup also made my CD-ROM drive available (not selected by default) for backup, which is actually quite convenient for when you need to get a CD-based program onto your laptop computer. Using a parallel-port-based tape drive, I backed up files from a CD-ROM and then moved the tape drive to a laptop and restored the files onto its disk. Starting a backup is as easy as clicking on an entry in the pop-up menu of a backup definition or dragging a definition onto a backup device. The program optionally uses STAC compression to get more on each tape cartridge. You can select zero compression, fast (less) compression, or tight compression. You can also choose to have Seagate Backup automatically perform a verification pass, checking the new tape contents against the files on the disk. Backup operations write a catalog on your disk. When you select files to restore, Backup tells you (by date and timestamp) which tapes contain those files so you can select which version you want to restore.

The scheduler allows flexible, automatic, unattended backups, including mixing backup types. For example, you could schedule a complete backup weekly, with daily incremental backups all to take place with-

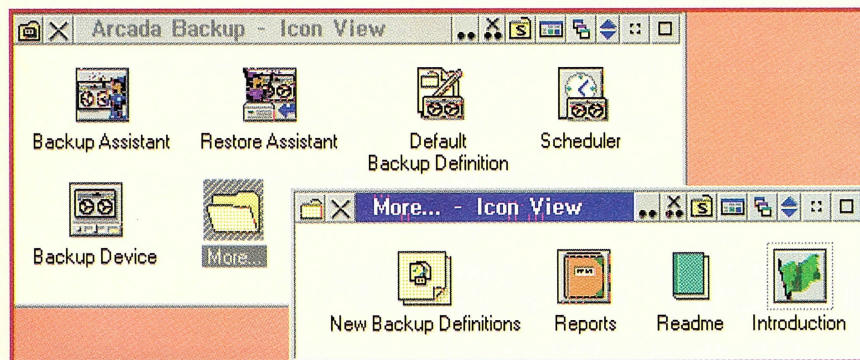


Figure 1: You can drag and drop backup definitions onto a backup device or step through the Backup Assistant.



out operator intervention. The incremental backups can include all files changed since the last complete backup, or only files that have changed since the last incremental backup. You can specify backups once, daily, weekly, or monthly. The scheduling flexibility is vastly superior to competitors like BackMaster, and reports are generated during unattended backup so you can review the results at your leisure. The Reports object allows you to view the results of backup/restore operations or send them to the printer. You can also determine how many generations of backup/restore report logs to maintain.

### Other considerations

I'd like to see more tape utility options, such as the ability to remove the last backup set from a tape cartridge without erasing all that precedes it. Also, an uninstall program is included, although it isn't mentioned in the documentation. That's probably because it's only a partial uninstall program. It removes the desktop objects and the new desktop classes created but doesn't remove any of the files from your disk or undo the changes it made to your *config.sys* file. In other words, the program is out of sight, but still occupies around 3.5MB of disk space and uses up system resources by loading device drivers.

### Glee or flee

I still tend to recommend SCSI solutions, but with its greater ease and flexibility over BackMaster, Seagate Backup is now my backup product of choice for those with floppy or parallel-port-based tape drives. But the list of supported devices, while lengthy, is finite. I strongly suggest you give Seagate a call to confirm support for your hardware before buying. Those with SCSI tape drives will be interested to hear that Seagate plans to release a professional version of Seagate Backup, which will support SCSI devices, this summer.

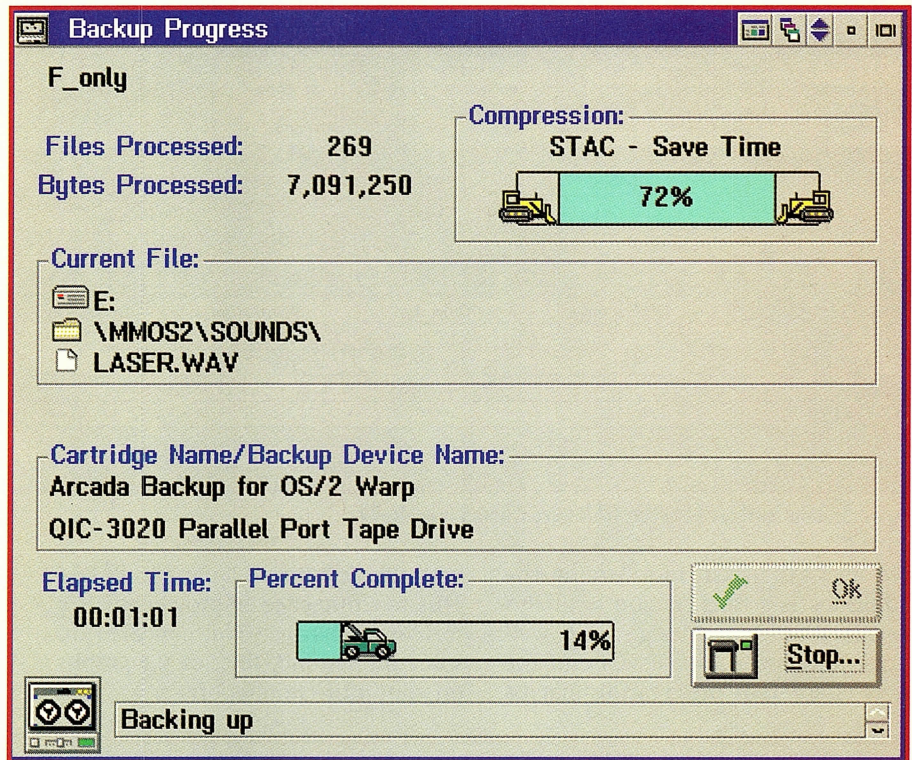


Figure 2: Seagate Backup optionally uses STAC compression to get more on each tape.

## DBExpert 2.0.1

When we reviewed DBExpert 1.0 a year ago ("Expert Magic," July 1995, pp. 17-21), it was a new product that had promise but wasn't quite ready for prime time. Designer Software has been busy in the past year, and version 2.0 shows great progress.

### In case you missed the first review. . .

DBExpert is a relational database product designed to work with several database formats, including dBASE, DB2, Clipper, FoxPro, FoxBASE, and Oracle. It uses a graphical interface to allow quick development of database tables, plus forms for entering and updating data in those tables and queries and reports for examining that data. You can directly create dBASE tables with no other software, but you will need separate licenses for the other database managers to create tables in those formats. Tables can be joined by means of one-to-

one, one-to-many, or many-to-many relationships.

### So what's new?

The first thing I noticed was a whole new manual. The *Getting Started* tutorial is a great addition and helps newcomers get up to speed with the product. The chapter numbers apparently changed late in the process, though, because there are frequent references to other chapters that are incorrect. The figure numbers in the text don't always match the numbers on the screen shots either, but you can generally figure out what was meant. The other errors may sound like small things, but they make me wonder whether a vendor spends the same level of attention on removing problems in the code as they do problems in the book. That concern grew when I found, in the sample database application that ships with the product, a bug that can lock you in a loop. Still, I'm glad the book and sample are included.

The *User's Guide* has been rewrit-



## Test Drives

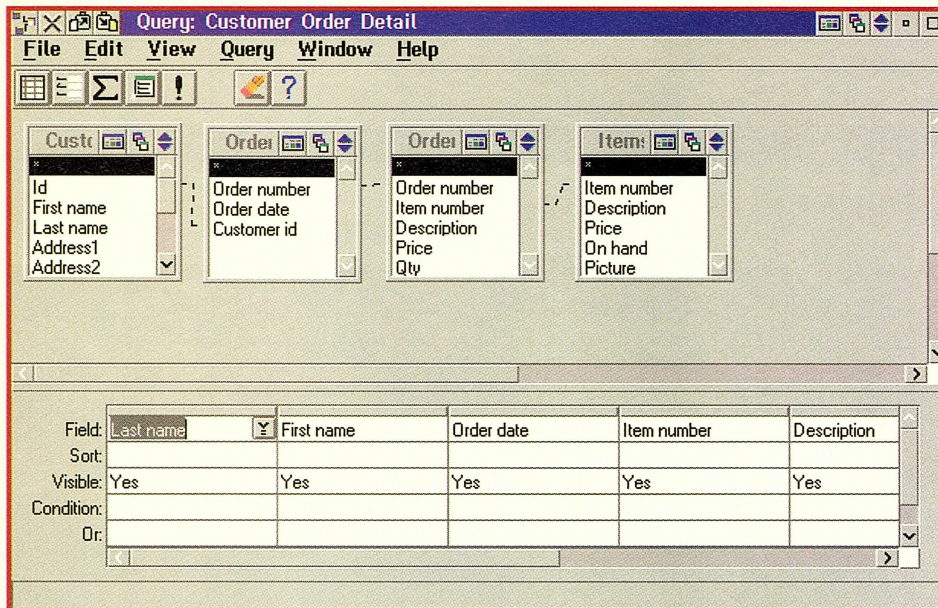


Figure 3: Relationships between tables are created graphically.

ten and expanded, too. Among the additions is a brief section with tips for database table design; it is well organized and complete. One of the new chapters is on creating macros

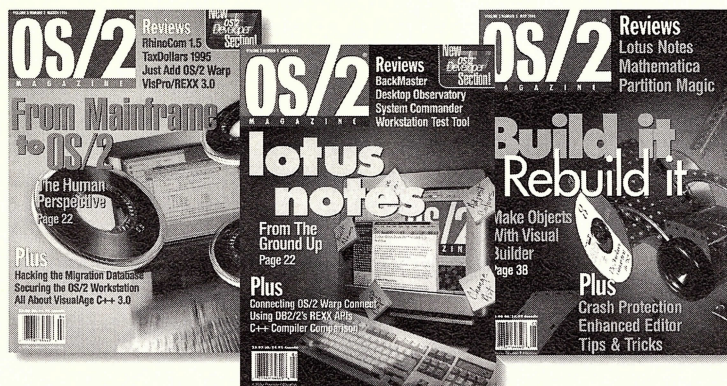
with the new macro language, REXX! This much-needed improvement is a welcome change. You can also do some limited bar, line, or pie graphs on your forms and reports now.

### Other features

Designing queries is done easily and graphically; tables are joined by drawing lines connecting fields. As you design the query, DBExpert creates SQL statements behind the scenes. Those who are proud of the scars they've earned in developing SQL expertise will be pleased to hear that you can access these SQL statements and edit them directly.

DBExpert was designed with multiple user environments in mind. If a user is modifying information in a table, locking is done at the record rather than file level so that others can continue using the database simultaneously. Designer Software claims improved multithreading in version 2.0 also. I can't say that the differences were noticeable in the test environment, but I didn't have 30 people all banging on it at the same time, either.

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## Test Drives

### Remaining anomalies

For some reason, new forms are often created with the top of the form off the top of the display. You can't get to the title bar, and for some reason the <Alt+F7> key sequence to activate Window Move mode doesn't work when the form is first created. You have to end DBExpert and reload it, bring the form back up, use <Alt+F7> to activate Move mode, then move the form back into the screen area before it can be used. The manual actually describes this workaround, meaning Designer Software was aware of this major problem and chose not to correct it before shipment.

The field content validation is good, but an obvious convenience is left out. If an error message pops up telling you that a specific field is out of range, null, or otherwise doesn't pass the test, the cursor should be moved to the field that failed the test rather than forcing the user to go there manually.

I know other database programs do this too, but the programmer in

me cries out against using fixed column numbers to reference fields. If I insert a field into a database, I run the risk of having to manually locate and change dozens of references to every column coming after the new one. If fields were referenced by column name rather than number, the problem would go away.

There is still no uninstall routine. Removing DBExpert is discussed in the manual, but the discussion there is incomplete—it doesn't include removing the changes the install program made to your *config.sys* file.

### Glee or flee

Especially with the reduced price, version 2.0 is a significantly more attractive product than its predecessor and worth your time to re-evaluate. **OS/2**

*Brian Proffit was part of IBM's OS/2 team and left IBM to become the director of PC Week's Corporate Labs. He is now the president of Visionary Research, senior contributing editor for OS/2*

Magazine, and solutions advisor to PC Magazine. He can be reached at 75300.1466@compuserve.com.

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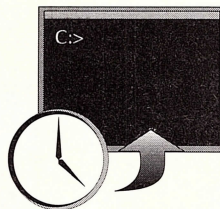
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# Potpourri of REXX Items

BY DICK GORAN

**T**his month, I searched my e-mail for readers' requests for information. The column, therefore, covers several topics.

## Finding files

REXX offers a couple of methods for locating files. The simplest and most common is the **STREAM()** function. The **STREAM()** function, with a second parameter of **C** and a third parameter of **QUERY EXISTS**, will return the full file system name of the file named in the first parameter. Using a third parameter of **QUERY SIZE** will return the file size of the named file. In both cases, a null string is returned if the file does not exist in the current directory.

However, if the file you are looking for has had its hidden or system attribute flag set, **STREAM()** will not see it. The **SysFileTree()** function in **REXXUTIL** must be used. **SysFileTree()** will build a stem, or compound, variable containing all of the files in the current directory, and, optionally, any subdirectories. Tail **.0** of the stem will contain the number of entries that the function assigned to the stem variable, including **0** if no file information was returned. **SysFileTree()** is quite flexible with the information it puts into the stem variable for each file. By default, five fields are returned for each file: the file's date in the format: **mm/dd/yy**; the file's time in the format: **hh:mm**, followed by a lowercase **a** or **p** for A.M. or P.M.; the file's size in bytes; a five-character field containing a list of the file's attributes; and the full file system name.

Because the year is returned as a

two-digit value, you should give consideration to the year 2000. For formatting the date returned by the function: if the two-digit year is less than 80, I prefix the two-digit year with 20; otherwise, I prefix the two-digit year with 19.

The field containing the file's attributes is a positional string with each position respectively representing the attributes **archive**, **directory**, **hidden**, **read-only**, and **system**. An example of a simple technique for checking for a specific file with **SysFileTree()** rather than **STREAM()** would be:

```
call SysFileTree file_name,,
'stem'
if stem.0 = 1 then
  say file_name,
  'exists'
else
  say file_name,
  'does not exist'
```

Next, you probably want to parse, or separate, the fields returned in the stem element. You can safely parse these fields, without concerning yourself with FAT vs. HPFS file names, with:

```
parse value stem.1 with,
file_date,
file_time,
file_size,
file_attributes,
file_path_and_name
file_path_and_name =,
STRIP( file_path_and_name )
```

Any of the attributes that are set for the file are represented by the first letter of the attribute appearing in uppercase at its defined position

in the string. Typical of REXX, numerous ways exist to test the attribute list for a specific value or values. The built-in **SUBSTR()** function allows you to explicitly reference a specific position or positions within the field. The built-in **POS()** function allows you to test for a specific character in the attribute list. The often overlooked built-in **VERIFY()** function allows you to test for the presence of one or more attributes. The following example will test for the presence of the system and read-only attributes:

```
if VERIFY( file_attribute,,
'RS' ) > 0 then ...
```

## Numeric vs. character strings

REXX treats all data as character strings unless that data is used in an arithmetic operation. For example **a = 0001** followed by **say a** will display the original string of **0001**. However, **say a + 0** will show a string of **1** without the leading zeroes. If you have to pass a fixed-length string containing numeric characters to a subroutine or function, the built-in **RIGHT()** function will serve your purpose. By adding a third parameter of **0** to the **RIGHT()** function, the resulting value will be padded on the left with leading zeroes. If you want to be sure that a string containing numeric characters is passed to the subroutine intact, enclose the string in quotes and pass it as a non-numeric, literal ('0001').

In a related area, comparison of numeric strings must sometimes be given special consideration. Given the following two assignments:



```
a = 0001
b = 01
```

a comparison of `if a = b` will yield a 1 (*true*) whereas `if a == b` will yield a 0 (*false*).

## Disk volume labels

Most of us have never given much thought to the volume labels on our disk drives. However, with the popularity of OS/2 Warp Connect, and with more systems becoming connected, drive volume labels can reduce the confusion as to which drive is where. To see the label assigned to a drive, you can issue the **VOL** command from an OS/2 or DOS command line. The volume label is also available following the third word of the string returned by the **SysDriveInfo()** function in REXXUTIL. Because the volume label can contain embedded spaces, the **Parse** instruction should be used to extract the volume label, and the built-in **STRIP()** function should be used to remove leading spaces. For example:

```
string = SysDriveInfo( 'C:' )
parse value string with,
    drive_letter_colon,
    free_bytes,
    total_bytes,
    volume_label
volume_label =,
    STRIP( volume_label )
```

Assigning a new label that indicates the machine and the drive letter as it is known on that local machine saves some confusion when multiple machines are referencing the drive. First, each machine should be identified with a name. Each of my *config* files contains the statement:

```
SET MACHINE_NAME=name
```

My notebook is named AST01 and my REXX programs can interrogate the machine they are running on with:

```
machine_name =,
    VALUE( 'MACHINE_NAME',,,,
        'OS2ENVIRONMENT' )
```

## Listing 1: 9608LS01.cmd.

```
/* 9608LS01.CMD - assign meaningful volume labels */
/*
   This program will assign a volume composed from the machine
   name and drive letter to all local drives on your system.
   It requires an environment variable be set as follows:
       SET MACHINE_NAME=name
   where name should be 8 or fewer characters.
*/
/*-----*\
| Register REXXUTIL |
\*-----*/
call RxFuncAdd 'SysLoadFuncs', 'REXXUTIL', 'SysLoadFuncs'
call SysLoadFuncs
machine_name = VALUE( 'MACHINE_NAME',,, 'OS2ENVIRONMENT' )
if machine_name = '',
    |,
    LENGTH( machine_name ) > 8 then
do
    say '    1 to 8 character machine name required'
    exit
end
local_drive_list = SysDriveMap( 'C:', 'LOCAL' )
do while local_drive_list \= ''
    parse value local_drive_list with,
        drive_letter_colon,
        local_drive_list
    parse value SysDriveInfo( drive_letter_colon ) with,
        drive_letter_colon,
        free_bytes,
        total_bytes,
        old_volume_label
    old_volume_label = STRIP( old_volume_label )
    new_volume_label =,
        machine_name ||,
        ' ' ||,
        drive_letter_colon
    'echo' new_volume_label,
        '| label' drive_letter_colon ||,
        ' 1>nul 2>&1'
end
exit
```

Listing 1 (available via anonymous FTP) contains a program that can be used to assign a meaningful volume label to each drive on my system. The volume label will be of the form: **machine\_name drive\_letter**. Since a volume label is restricted to 11 characters, your machine name must be kept to eight or fewer characters because the intervening space, drive letter, and colon will occupy three bytes. The three drives on the notebook have the volume labels:

```
AST01 - C:
AST01 - D:
AST01 - E:
```



Dick Goran is the author of *The REXX Reference Summary Handbook, an OS/2 reference*. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, Lib 6 on CompuServe or FTPed from <ftp://ftp.cfsrexx.com/pub>. He can be reached via e-mail at [71154.2002@compuserve.com](mailto:71154.2002@compuserve.com).

## Resources:

**9608ls01.cmd (available free for download)**

FTP [ftp.cfsrexx.com/pub](ftp://ftp.cfsrexx.com/pub)



**S**canner reviews in general computing magazines focus on subtle distinctions in features: dots-per-inch, scanning speed, quality deviations of the scanned images. Rarely, however, do they mention how—or if—the equipment works with OS/2. Yet to an OS/2 user, minor variations between scanners are irrelevant if the hardware won't work.

For this article, we examined scanning in the context of OS/2. We set up and installed SCSI-based flatbed scanners from Hewlett-Packard, Canon, Fujitsu, and Mustek. We ran them with the included software (typically Windows), and then used the scanners with native OS/2 scanning applications. We didn't evaluate the feature sets of the scanners so much as their scanning in the context of OS/2.

The scanners were tested on a 90MHz Pentium-based system with a QLogic FastSCSI IQ PCI-10 adapter. Some included an adapter card, but we didn't always use it. We also checked some scanners on a 60MHz Pentium system with an Adaptec 1520, and, in one case, on a 90MHz Pentium PC with an AccuLogic SCSI adapter.

The testing process was frustrating. A SCSI device has to be turned on at boot time or it won't be recognized; you can't switch equipment on the fly, so we had to shut down and reboot often. Because our hard disks are also SCSI, the OS2DASD driver (which controls how OS/2 handles hard disks, among other things) tried to "own" the scanner. We encountered scanning problems until we included *config.sys* parameters to tell the SCSI driver to keep its hands off the device on SCSI ID 5.

Some companies won't support OS/2 at all. Don't waste your time looking at scanners from Logitech, Microtek, or Plustek. Even if you can fiddle with the scanner until it works, the company may deny support when you need it.

### Canon IX-4025

The color Canon IX-4025 included a tiny Adaptec 1502 adapter. Software included a TWAIN driver, Ofoto scanning and image-manipulation software, a limited edition of OmniPage OCR (optical character recognition, an algorithm to convert images to text), and Canon-specific Image-In copier software.

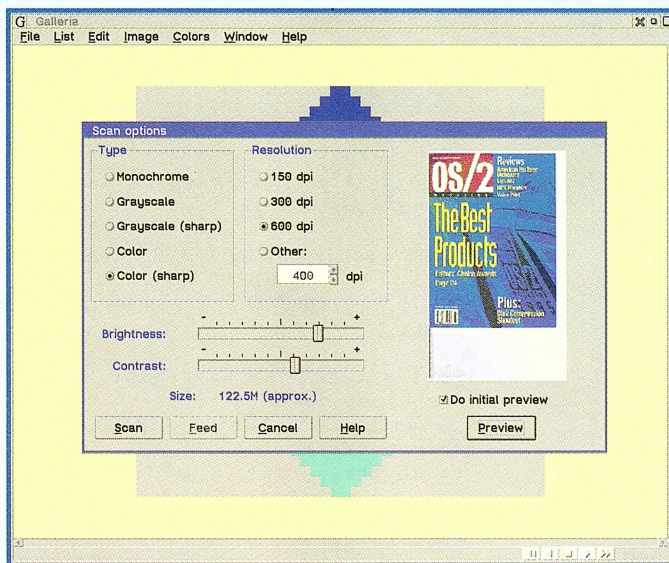


Figure 1: Galleria provides an adequate (if not awe-inspiring) number of controls for scanning images.

We plugged the scanner into the QLogic SCSI port and used Win-OS/2 to load the included software. The TWAIN installation reported that it couldn't find a scanner. A dialog asked whether we were using the included adapter or another ASPI-compliant adapter (with "Adaptec" in parentheses). This worried us slightly, because we didn't know how compliant the QLogic card was. Eventually, by twiddling settings and using foul language, we could run TWAIN's setup right after starting Win-OS/2—but it GPFed every time. Ofoto also insisted that no scanner was found.

Wondering whether the adapter was at fault and not OS/2, we installed Canon's SCSI card (Adaptec 1502) in the Pentium/60. OS/2 Warp didn't have a listing for that adapter, so that approach didn't get us very far. Using an Adaptec 1510 (which OS/2 Warp does understand) didn't help much; we were able to crash in a different part of the software.

We checked Canon's CompuServe forum (which was full of irate users), and also (anonymously) called Canon's telephone technical support. After we had been on hold for 25 minutes, a weary-sounding technical support rep said, "Of course, we don't support OS/2 Warp." Canon only supports its scanners with Windows 3.1; they don't work with

Windows NT or Windows 95 either. The technical support rep said that we were the first to ask about OS/2 and scanners. We resisted the impulse to tell him that his company's response ensured we'd be the last. Don't bother calling Canon for scanner sales, much less tech support.

### Fujitsu ScanPartner 10

The ScanPartner 10 is a 10ppm black-and-white scanner meant for document management and OCR. It includes a document feeder and is built to feed pages *fast*. No software is included.

The ScanPartner 10 worked on the QLogic-based system, right out of the box, with UniteLite. We had to tweak the brightness settings a little bit, but overall performance was great. Recognita's OCR documentation intimated that it would support (unspecified) Fujitsu scanners, but no drivers were included in the package; the company was unable to confirm the existence of such drivers.

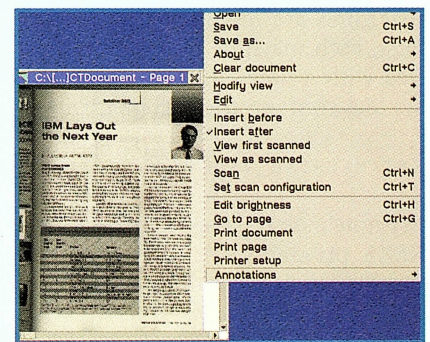


Figure 2: UniteLite scans and manages documents in folders and file cabinets.



We tried to encourage the Windows Pixel drivers to work with the QLogic card to no avail, so we lugged the Fujitsu across the office to the machine with the AccuLogic SCSI adapter, hoping that its configuration would allay the software gods. We plugged in the scanner and restarted the machine...and OS/2 Warp choked. Most of the desktop was gone; software registrations had disappeared. We unplugged the scanner, rebooted, and half of the system came back. Plugged it back in, and the system was strange again. We can't imagine how this could happen, but it did. And, for what it's worth, the Pixel software didn't see the ScanPartner here either.

However, when the same scanner was plugged into the ordinary, lowest-common-denominator Adaptec 1520, it worked quite well. The Pixel application read the document quickly and accurately. Xerox's Textbridge OCR software worked without a hitch.

### **Mustek MFS-6000CX**

The Mustek MFS-6000CX is a 24-bit color scanner that is built to operate with either a PC or a Macintosh. It includes a small interface card and cable, as well as a TWAIN driver, a limited edition of Micrografx Picture Publisher 5.0, and Maxsoft-Ocron Wordlinx OCR. Both ends of the cable are of the "old format" that looks like a printer cable.

The printed instructions assume that you'll use the included interface card, but (daunted by too many trips under the desk, and with an eye on the SCSI-1 port mentioned only in the Macintosh installation instructions) we tried to use the Adaptec first. The TWAIN installation instructions did say that we could use a 1500-series Adaptec adapter, but OS/2 adamantly refused to load the *vaspi.sys* driver, with or without an extra terminator on the scanner. Vanquished, we shut down and installed their card.

TWAIN installed trouble-free in Windows. Wordlinx OCR software was too limiting, even for a limited edition; if you want OCR even infrequently, buy another package.

## **Now that I have a scanner, what can I do with it?**

**S**ome of the scanners we examined included software—but always Windows software. If you want to use OS/2 applications with your scanner, what are your options?

Solution Technology's Applause is an image-capture and viewing utility that includes a TWAIN-compliant engine. The application is very basic; you can't preview the image to crop it ahead of time, and you have little control over the image after it has been scanned. The company's other application, ReView, is a document-imaging program that lets you manage lots of scanned data. Or it's supposed to be; we spent a few days trying unsuccessfully to get it to work, even with beta code (which crashed our machine). We'd used Applause successfully in the past, however, with a Hewlett Packard ScanJet IIp, so we attribute these difficulties to the foibles of beta software and the conflicts encountered with all those device drivers.

NovaStar Impos/2 is a graphics package that does much more than just scanning; you can manipulate images, do screen captures, and more. Impos/2's scanning features include a preview function, with brightness and contrast controls. A new version of Impos/2 was just released in Germany; since the English version wasn't out at the time of this writing, we're not sure what scanning enhancements the company has made.

Bitware's Galleria is another full-featured graphics utility that lets you manipulate images as well as scan them (Figure 1). It works only with HP ScanJet scanners. The software is extremely reliable and reasonably customizable—definitely worth a closer look.

Cirrus Technology's UniteLite folder and document management is a document image storage and retrieval system that is Workplace-Shell-enabled (Figure 2). While you can acquire documents in many ways, we explored UniteLite's ability to scan. It supports the Hewlett Packard ScanJet II series and Fujitsu scanners. That's a limited number, but the software scanned efficiently every time. UniteLite never seemed to be bothered by the existence of other scanner drivers, and we never discovered a situation in which it caused a conflict with another package.

At the high end of document imaging is IBM's ImagePlus VisualInfo. ImagePlus is document management and retrieval meant for very large enterprises; it started out as a mainframe package, then moved down to the midrange (RS/6000) and is available for OS/2-based client-server setups.

Trafalgar Business Systems' CopyShop/2 lets you use your scanner as a copier (Figure 3). If you have a color HP ScanJet and a color printer, this utility gives you an instant color copier. (It also works with black-and-white HP scanners and printers, but that seems less dramatic.) You can also use CopyShop/2 to send faxes directly from your scanner. Using the initial release with an HP ScanJet IIp would mysteriously lock up our computer, but based on previews of the newer version, available by the time you read this review, CopyShop/2 is definitely nifty.

CopyShop/2 includes a copy of the Danmar HP drivers, which you also can purchase separately. These software drivers make an HP scanner accessible to OS/2 scanning applications and help scanning in Windows programs. If you're considering the Danmar drivers, you should spend the extra \$20 and get CopyShop/2 as well.

Recognita Plus 2.0a OCR for OS/2 is outstanding at multithreading. Unfortunately, the software is less impressive when it comes to turning the scanned image into text. We found the (Windows-based) Xerox TextBridge much more efficient. Recognita promises a new OS/2 version soon, perhaps by the time this review is published. The current version supports HP ScanJet, HP ScanJet Plus, HP ScanJet II/c, II/p, II/cx; Umax UG630, UC630, UC300, UG80 (ISA only); Epson GT-4000, GT-6000, GT-6500, GT-8000 (ISA only); Pentax SB-L301, SB-A4301 (ISA only); and AVision AV100 and AV800.

How do these compare to their Windows brethren? Many of the Windows scanning applications give you more control over the manner in which you scan the image: color control, dithering, and so on. However, graphics programs are CPU-intensive by nature and scanning an image in Windows takes a long time. You might be more frustrated by the Windows hourglass than by scanning the image a few extra times (Figure 4).



## Never the TWAIN

The nice thing about standards is that there are so many of them. In the nasty old days of DOS, every software manufacturer had to provide drivers for any hardware to which the application might talk. As hardware became more complex, requiring "terminate and stay resident" drivers, users encountered conflicts; Product A wouldn't work correctly if the driver for Product B was loaded.

In 1991, several vendors in the computer industry got together to create standards. According to the white paper on the subject, "TWAIN defines a standard software protocol and API (application programming interface) for communication between software applications and image-acquisition devices (the source of the data)." TWAIN-enabled applications let you scan data directly into them; TWAIN manages the communication between the application and the hardware. Few scanner manufacturers create their own drivers anymore. They use TWAIN or ISIS (from Pixel Translations); Hewlett-Packard also supports its own proprietary interface.

Unfortunately, a system-resident TWAIN driver isn't available for OS/2, though you can often use TWAIN in a Win-OS/2 session. Solution Technology markets an OS/2 TWAIN-compliant driver to scanner manufacturers, but "compliant" isn't necessarily the real thing. You'll need a separate driver for every scanner; you can't assume that any scanner will work right out of the box. Solution Technology's TWAIN support lets you use the scanner in the company's own applications (Applause and ReView), but you can't acquire scanner data from within a word processor or spreadsheet.

IBM hasn't ignored this situation entirely. According to IBM's Glen Christensen, input device evangelist for OS/2, IBM is investigating options that would allow OS/2 to include TWAIN support as a scanning subsystem. Don't expect results very soon; TWAIN won't be included in Merlin, and IBM isn't discussing a timetable yet.

In the meantime, every application has its own scanner driver. When Recognita's scanner support is loaded, you can't scan into Galleria or CopyShop/2. With Solution Technology's drivers loaded, something else will refuse to work. If you want to use several scanning applications, you'll have to comment out scanner driver lines in *config.sys* and reboot—which is not what OS/2 is supposed to be about.

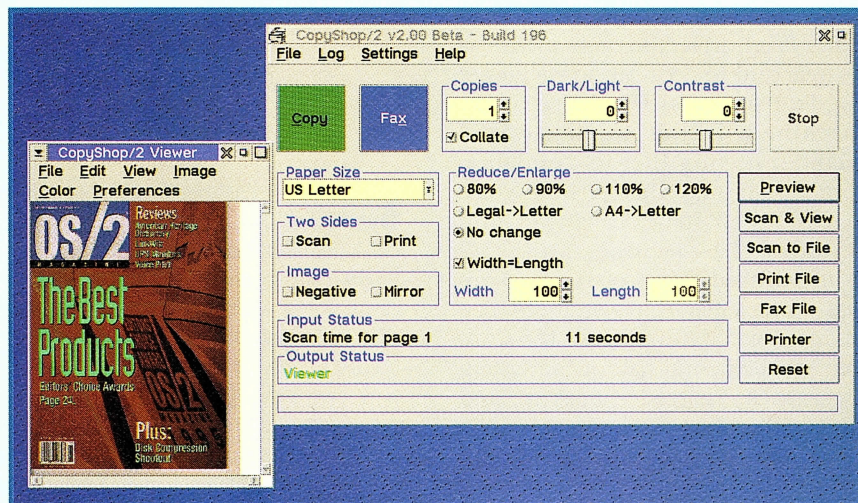


Figure 3: CopyShop/2 works only with Hewlett-Packard scanners. It scans documents directly to your printer or fax software.

Picture Publisher scanned the image adequately, with good color quality. TextBridge worked well, too, though its accuracy with the Mustek seemed much lower than it had been with the Fujitsu ScanPartner.

Impos/2 ostensibly works with the Mustek MFS-6000CX, as long as you're using an Adaptec SCSI adapter. Since we couldn't convince VASPI or Impos/2's own version of ASPI to load, we weren't able to get the scanner working in the time available.

### Hewlett Packard ScanJet 4c

The Hewlett-Packard ScanJet 4c is a 600dpi scanner that supports 30-bit color and 1024 shades of gray. It comes with its own adapter card and clear instructions on how to use an existing SCSI adapter. You also get HP DeskScan II, Visioneer PaperPort, an HP ScanJet Copy Utility, Corel Photo-Paint, and Caere's OmniPage Limited Edition.

Hewlett-Packard's manual was the only one to mention OS/2. Their fax-back service included a document describing how to install an HP scanner in an OS/2 system. You'll need the instructions; the version of DeskScan that's included won't run in OS/2, so you'll have to download the older one. You'll need to change settings and copy files around. And you might have to buy third-party drivers.

Here, at least, the exercise is worth it. All of the OS/2 scanning applications worked. While they each consumed a lot of CPU attention (and a 118MB swap file, in one case), we could live with it. The Windows applications also worked fine, as long as they ran full screen. While some fiddling was required to get everything working well, after all was said and done, it felt like the beginning of a long and rewarding relationship.

### Scan-dalous advice

What wisdom have we gained from this painful experience?

It's upsetting to own two top-end SCSI adapters that are built for moving data at high speed and to have the scanners work only with a bottom-of-the-line \$50 board. If you don't yet own a SCSI adapter but are contemplating a purchase, pick Adaptec as your brand. (Pixel supports only Adaptec models 1520 and above and recommends the 154xCF model, especially at higher speeds. PCMCIA cards are not yet supported.) Other SCSI adapters might work, but you can't count on it. That's too bad, since we've been happy with QLogic and impressed by the responsiveness of their technical support.

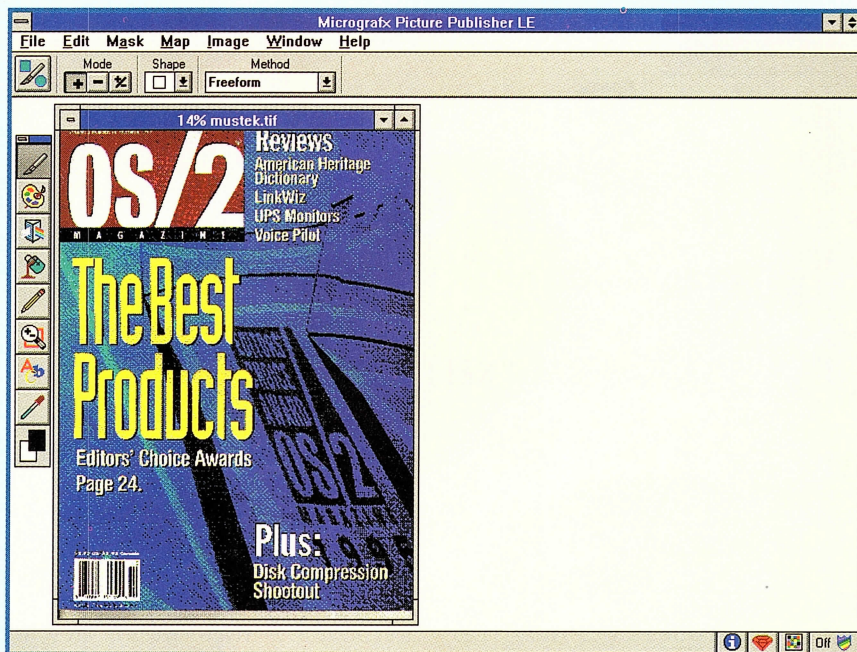
Acquire the scanner and the adapter before you purchase a cable. The scanner might include one, but if you have to spend extra money, it will help to own the right kind. These things are expensive.



# Review

Choose a Hewlett-Packard scanner. HP showed the most respect for OS/2 users. Every piece of image-scanning software (for OS/2 or Windows) supports the HP scanners first. This approach is both safe and reliable. Pick another brand only after you have investigated how well it works in OS/2 and how many OS/2 applications support it.

We had no problems with image quality on any of the scanners and no apparent difference between running OS/2 or Windows applications. Of course, we encountered differences based on the nature and price of the scanner (a black-and-white 25ppm scanner will be better at OCR than will a \$500 color unit), but nothing that we'd attribute to running the equipment under OS/2. **OS/2**



**Figure 4:** In most cases, the Windows software included with the scanners performed as promised. But because the Windows programs (such as this one, importing from a Mustek scanner) are still Windows programs, you'll remember why OS/2's pre-emptive multitasking sounded like such a good idea. You'll see a lot of Windows' hourglasses.

*Esther Schindler is a computer consultant and writer. She is a senior contributing editor to OS/2 Magazine, the sysop of Ziffnet Executives On-Line Forum on CompuServe, and co-author of Teach Yourself REXX in 21 Days, from Sams Publishing. You can contact her at 72241.1417@compuserve.com.*

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Fax (800) 848-4123  
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### Fujitsu

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Fax (800) 626-4686  
READER SERVICE NO. 111

### Hewlett Packard

(800) 333-1917  
Fax (617) 224-1100  
READER SERVICE NO. 112

### Mustek

(714) 250-8855  
Fax (714) 250-3372  
READER SERVICE NO. 113

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Fax (301) 698-1909  
WWW <http://www.cirunite.com>  
READER SERVICE NO. 114

### DANMAR drivers (\$49.95)

Farrel Co.  
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E-mail [kshafra@nando.net](mailto:kshafra@nando.net)  
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### Recognita Plus for OS/2 (\$395)

Recognita Corp.  
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E-mail [70313.1266@compuserve.com](mailto:70313.1266@compuserve.com)  
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### Applause (HP \$199, Logitech \$149, Review \$299)

Solution Technology  
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Fax (407) 997-6518  
E-mail [solution@gate.net](mailto:solution@gate.net)  
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## Software Resources: Cont'd.

### CopyShop/2 (\$69)

Trafalgar Business Systems  
(212) 673-9000  
Fax (212) 955-2777  
E-mail [76070.626@compuserve.com](mailto:76070.626@compuserve.com)  
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### ImagePlus VisualInfo

IBM  
(800) 627-8363  
(770) 835-9902  
Fax 770-835-8164  
WWW <http://www.austin.ibm.com/developer>  
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### Galleria (Individual \$63, Corporate \$285-\$1,476)

Bitware Australia Pty. Ltd.  
(61) 6-2810175  
E-mail [bitware@ibm.net](mailto:bitware@ibm.net)  
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### Impos/2

NovaStar  
Distributed in the U.S. by Indelible Blue  
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WWW <http://www.indelible-blue.com/ib>  
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# Programming the OS/2 Warp PM

BY STAN KELLY-BOOTLE

**A**s we have been conditioned to expect over the years, the OS/2 story continues to unfold with its fascinating blend of good and bad news. What's encouraging is that the good news has predominated of late, with strong OS/2 Warp sales and major application announcements. Even the mainstream computer press, indifferent or actively cynical for so long, seems to be taking a more positive line when reporting OS/2 activity. The OS/2 book publishers are also encouraged.

Certainly, John Wiley & Sons are bullish on OS/2, as witnessed by two excellent books on PM (Presentation Manager) programming: *OS/2 Warp Presentation Manager Mentor—Foundations of PM Programming* by Michael Drapkin (John Wiley & Sons, New York, 1996, 344 pages, \$39.95, ISBN 0-471-13167-9), and *OS/2 Warp Presentation Manager for Power Programmers* by Uri J. Stern and James S. Morrow (John Wiley & Sons, New York, 1995, 554 pages, \$34.95, ISBN 0-471-05839-4). These two books are a reviewer's dream: their titles are crisp and clear, their authors uniquely qualified.

*OS/2 Warp Presentation Manager Mentor* is an introductory tutorial for PM programmers based on the author's first-hand grind as project manager for OS/2 client/server applications at a leading Wall Street brokerage firm. For OS/2 historians, the foreword by Scott Kliger, former lead PM developer at IBM, is honest and revealing. He tells of the hectic struggle to complete OS/2 2.0 by the end of March 1992. Version 2.0 was actually released in the early hours of April 1,

a date that IBM appropriately dubbed March 32! Drapkin's book lives up to its title. A mentor is a kindly teacher, leading you gently and patiently with lots of encouragement along the way. The author expects you to know C but assumes that you are new to event-driven GUI programming.

If I must nitpick (if only to prove that I have read the book), the sample Module Header code (p. 14) has a commenting-closure error on line 21 (in spite of many warnings elsewhere about the dangers of incorrect commenting syntax). I also question the value of Chapter Three; its 33 pages devoted to elementary C programming concepts contradicts the preface's instruction to "go out and learn C programming before you tackle PM programming." Appendix B, "Advice to Mainframe Programmers," means well, but overwhelms us with blandness: "Don't make the mistake of trying to bring your mainframe environment with you...A positive attitude can go a long way..." Programmers who fail to understand "the event-driven paradigm" may have to "return to the stagnant world of the mainframe."

In spite of these well-formed niggles, I must stress that Drapkin's *OS/2 Warp Presentation Manager Mentor* is a sympathetic, evangelical introduction to PM programming. The progressive code samples, included on the enclosed disk, are working applications that you can copy and modify, although I am loath to interpret the attached copyright notice.

Stern and Morrow's *OS/2 Warp Presentation Manager for Power Programmers* makes no bones about its

target audience: "The advanced OS/2 developer who wasn't born yesterday." This blunt monition is enormously refreshing after all those vapid mappings: "For beginner, intermediate, and advanced users; for all primates with \$34.95 spare change." No time is wasted on C syntax or PM basics, apart from the occasional subtle device: "As an experienced PM developer, you already know that..."

Uri Stern, formerly the PSP SWAT Technical Team leader, has been involved in PM since the initial OS/2 1.1 release in 1988. Stan (James S.) Morrow has also served his time in various OS/2 development and support capacities. They recently left IBM to form Stern & Morrow Software Consulting Inc. ([uri@icanect.net](mailto:uri@icanect.net)).

Why does Drapkin's 344-page *Mentor* cost \$5 more than Stern and Morrow's 554-page *Power Programmer*? The answer is that Drapkin provides a 3.5-inch disk, whereas the source code for Stern and Morrow is available from Wiley's FTP site ([ftp.wiley.com](ftp:wiley.com)). The preferred strategy will depend on your bandwidth and patience.

## Summary

If you're new to OS/2 PM, start with *OS/2 Warp Presentation Manager Mentor—Foundations of PM Programming*. If you're familiar with OS/2 PM basics, hone your skills with the more advanced *OS/2 Warp Presentation Manager for Power Programmers*. **OS/2**

Stan's latest book is *The Computer Contradictionary* (MIT Press). He welcomes e-mail via [skb@crl.com](mailto:skb@crl.com). Try his Web page at <http://www.crl.com/~skb>.

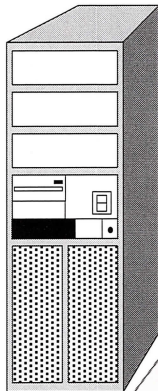


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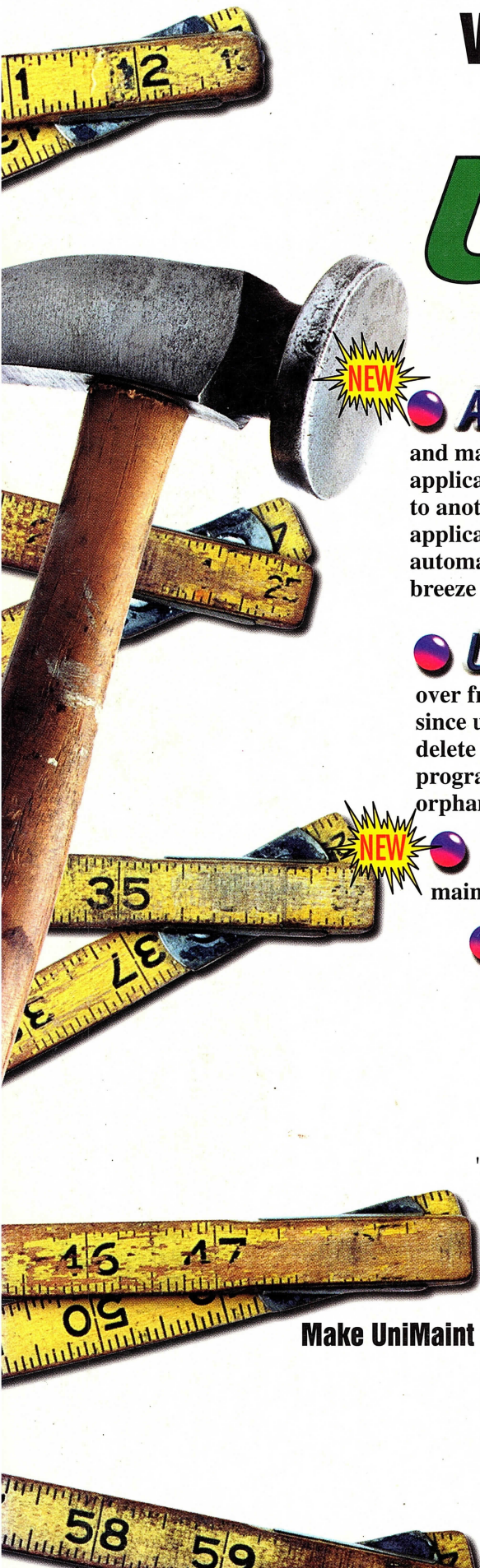
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